

NEWS IN BRIEF

No action on councillors' trip

NO action is to be taken against two Leeds City councillors who allegedly had a trip to South Africa last month paid for by ICL (CW, May 11). Following a meeting last week at which the two men were interviewed, a council statement commented: "With hindsight, all parties accept that it would have been preferable for arrangements for such a visit, which involved promotion of British computer technology, to have been made with the City Council."

Honeywell hit

DAMAGE estimated at between £500,000 and £1 million was caused to the Honeywell stores and warehousing centre at Segrate, near Milan over the weekend. The stores belong to Honeywell SpA, the controls division of the company, and the attack was part of a wave of bombing and arson which hit several Italian cities last week, following the discovery in Rome of the body of the murdered former premier, Aldo Moro.

Switching software

SOFTWARE has been introduced in the US by AT&T which allows the telephone company's Dimension private branch exchange to support the use of tie-lines between branch offices of a company. The software is called ETS for Electronic Tandem Switching, and was developed to beat off competition from private suppliers of tandem switching equipment.

Formula III sponsorship

A MAN who could soon be as well known as James Hunt or Niki Lauda is Rob Wilson, driver of the Formula III racing cars sponsored jointly by Royal Garton China and ICL. The 28-year-old New Zealander, pictured right, is currently lying sixth in the 39 Formula III championship and hopes to do well enough to move up to Formula II next year. Motor racing fans can see Wilson in action at Oulton Park, Cheshire, next Saturday, May 20; at Thruxton, Hampshire, on Monday, May 28; the Spring Bank Holiday; and at Brands Hatch on Sunday, June 11.



TV sub-titles for the deaf system

A SYSTEM to provide sub-titles for all television programmes for the benefit of deaf people is being developed at Leicester Polytechnic. Using the BBC's Ceefax service, shorthand keyboards, and a Burroughs 8700 computer, stenographers could provide a continuous stream of sub-titles to be superimposed on the normal television picture. Ceefax — and TV's Oracle — transmits textual information on unused lines at the top of the television picture, which can be decoded by special electronics in the receiving set and displayed as pages of characters in place of the picture. Ceefax already has a sub-title facility; this is one of the purposes for which Ceefax was originally invented. The problem that the researchers at Leicester are tackling is how to generate the text of the sub-titles. Preparing sub-titles from scripts, as is done with foreign films, would be too time-consuming and expensive, so the proposal is to use trained typists who would listen to the television sound as it goes out and record it in Palmtype shorthand keyboards, such as are used by court stenographers. These are special keyboards that are an alternative to manual shorthand. The typist records the speech in a special abbreviated phonetic code. The translation is normally done manually, but to make captions in real time, a computer system is being devised at Leicester to do the conversion by a process of dictionary look-up, and send the resultant English text to the Ceefax encoder to be broadcast.

Micros and jobs—Benn wants discussion

ENERGY Minister Tony Benn has called for a copy of the Earth Resources paper on the effect of microprocessors on employment (CW, May 11), so that it can be discussed at next month's meeting of the Home Policy Committee of the Labour Party National Executive. Benn is chairman of the committee. And a prediction by Barrie Sherman, research director of ASTMS, that there could be five million unemployed by the end of the decade, much of it caused by the development of information technology, is likely to have a major influence on the attitude towards new technologies. Sherman's forecast is part of his input to the TUC study on the shape of the quality of life in the future, which is due to be ready for the annual congress later this year.

Racal adds high speed modems

A NEW family of high speed voice band modems up to 9600 bps has been announced by Racal Ltd. Based on microprocessors, the new family consists of four models, the 9030, 9001, 4820 and 4801. They offer a range of options including test and diagnostic facilities and the Fastnet rapid synchronisation feature for multi-drop networks. Also available is the Dynaport device.

RAIR DECPRINTER I 180 c.p.s. Serial Printer. 132 column printing on 6-part forms. Field-proven 7 x 7 dpi matrix print-head. 11-position forms length switch. Paper out alarm. Parallel or buffered GCITT V24 interfaces. Prices from £1500. United Kingdom RAIR Ltd, 100-102, Victoria Street, London WC2H 9PP. Telephone 01-636 5463.

ICL invests £180,000 in SA non-Whites

A MAJOR commitment to non-White computer training has been made by ICL in South Africa. The ICL subsidiary is investing R300,000 (£180,000) in the training of Blacks, Coloured and Asians this year, and the first group completes the course at the end of the month. From 1,200 applicants, 40 were chosen for training and were streamed into two groups. "They all had either high-grade matriculation passes or were university graduates," John Sturkey, ICL South Africa managing director, told Computer Weekly. "and one is a medical doctor." Questions have been raised about the programme, because other computer companies have tried the same thing and failed, mainly because of poor selection at the start. But out of the 40, we know now that we will end up with 28 first-class trained people, mostly Coloured trainees, and there will be another 10 or so qualified people from the second stream, which finishes at the end of June. "We have people from seven different non-White ethnic groups on the course, and one of the pleasures has been to see the way people from different ethnic backgrounds have lived and worked harmoniously together." One of the students has asked about the possibility of employment with ICL in Nigeria, and while the primary aim is to meet the shortage of trained people in South Africa there will be opportunities for foreign postings within ICL. After the initial training period, during which Cobol programming, report writing and business training are included in the curriculum, it is planned that the trainees will have a spell in the field either with ICL or with customers, after which they will return for further education. ICL South Africa is one of the company's largest overseas subsidiaries, and has been extremely successful with large 2800s. Some 30 have been sold so far, including about a dozen 2800s and 2870s.

Poly man wins SSRC fellowship

A FELLOWSHIP lasting two years has been granted by the Social Sciences Research Council to Richard Bland, of Hatfield Polytechnic, to study the development of computing in the social sciences. The SSRC has also decided to support the Distributed Array Processor at Queen Mary College (CW, April 13) to the tune of £180,000, and is developing a self-contained mini-based statistical package for the use of universities. The fellowship will involve a survey of the whole computing scene as it affects research in the social sciences, particularly in survey analysis, econometrics, and geography. New developments in hardware and software will be looked at, and recommendations on improving social science computing will probably come out of it. The SSRC sees the DAP as an important new tool in econometric research, because of the highly complex calculations that are often involved, and has offered to contribute both to its capital and running costs. DAP software development will probably be supported. The council also has bought a small GEC 4070 minicomputer on which to develop a version of the well-known "Statistical Package for the Social Sciences" that could make a low-cost, dedicated statistical tool for universities and polytechnics.

Burroughs terminals range

THE new range of modular banking terminals from Burroughs, revealed exclusively (CW, November 11, 1977), has now been announced. Items in the line are included in the £10 million of terminals on order for the Altrincham Group of Trustee Savings Banks (CW, April 27). The new building blocks for the banking market include keyboard display units, printers and microprocessor-based concentrators, and represent a response to European companies like Philips and Datacube which pioneered the modular approach to the banking market and have made inroads in the US. £100,000 order. THE dual Argus 500 computer system installed by Ferranti in the Dyce Operations Centre of the BP Forth oilfield in 1976, is to be upgraded in a £100,000 order received by the company.

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Briefing The Othello challenge

REAL time systems consultants Zeus-Hermes, in conjunction with Computer Weekly, are running an Othello board game competition in London on July 7 at Zeus-Hermes headquarters, Shropshire House, 2/10 Copper Street, London WC1, starting at 7pm. Places for the competition are strictly limited and are by invitation only, with priority given to players who represent their DP unit. Applications for entry will be considered only on an official entry form, which contains full rules and details. Players, who can bring one guest, will be selected on the basis of completed applications. So hurry to get your form from Maureen Chapman, at the Zeus-Hermes address above or telephone 01-323 0837.

Level 6 expanded

TWO models have been added to Honeywell's Level 6 minicomputer range. Due to be announced today (Thursday), they are expected to bracket the existing machines in the line. Honeywell has also formally announced the CP-6 operating system which is designed to enable users of the Xerox CP-V operating system on Sigma machines to migrate to Level 66.

IBM X25 interface

AN INTERFACE and a software package which allows the Series 1 minicomputer to connect to X25 packet-switched networks has been announced by IBM. It is available on a request price quotation basis only, and is at present limited to Canada and France where X25 networks are being built. It will allow exchange of data with any other network user who can handle HDLC data frames.

DAP for atom men?

THE UK Atomic Energy Authority are likely to obtain the ICL Distributed Array Processor with a few years to join a £4 million 2880 at Risley, which was officially inaugurated last week. The DAP could provide additional power to the 2880 to run its workload as well as being used for special applications. See page 5 The Risley 2880.

Out night work, call

A MOTION for the abolition of "non-essential" nightwork was carried by the Post Office Group of the Society of Civil and Public Servants at the union's annual conference. A spokesman for the group said: "This applies to what we call 'office work' computing, such as the payroll and billing."



Dr Leslie Underhill, head of Central Computer Services Northern Division of the UKAEA, guides Energy Minister Tony Benn through the operation of one of the consoles at Risley. Looking on is John Evans MP for Newton.

Benn's warning on impact of technology

ENERGY MINISTER Tony Benn has called for a company-wide examination of the impact of computers and related technologies on jobs in order to prevent technology "cutting like a scythe through employment." Speaking last week at the opening of an ICL 2880 installation at the UK Atomic Energy Authority at Risley, Lancs (see page 5), Benn said that the impact of computers on society is likely to be "absolutely phenomenal," changing the nature of life in a deeper way than other modern technologies. He stressed that he believed that the public acceptability of the new technologies would be vital in determining the rate of their implementation. He feared that, if handled wrongly, it could lead to "very difficult political times in the 1980s." This is likely to happen, he said, because the technological developments are taking place at a time when there was also a world wide recession in manufacturing industries. It would, he believed, lead inevitably to an increase in the demand for public services, such as education and social services, to cope with the people made unemployed.

There seems to be a clear need for planning agreements involving active participation from employees in deciding on how to cope with unemployment that could be caused by computers," he said. He added that he believed there needed to be a complete rethinking of our educational system to provide increased education to cope with increased leisure time and that company planning agreements should examine issues such as flexitime, short working weeks and shorter working lives. Speaking earlier this month at the annual meeting of Apex, the

Call for legal data exchange

POLITICIANS from the 20 member states of the Council of Europe have called for an increased use of computers in parliamentary work to improve democratic control of the executive. At a meeting in Strasbourg last week, they proposed arrangements for exchanging computerised legislative information between parliamentary assemblies.

THE INSIDE NEWS

ALTHOUGH the triumphantly returning Hexadecimal Kid is not all human, the rest of Computer Weekly gives priority to flesh and blood. Joining Tony Benn (this page) in the great debate on the impact of information technology on employment is Oarek Grover, who argues for a basic national wage for everyone as a way of making maximum use of the country's human and machine resources (page 4). Chief programmer team is the Program-

Govt gets tough on standards

Manufacturers have been informed by the Computer Board that from January, 1979, the availability of internationally agreed networking standards will be an important factor considered by the board in awarding university and research establishment computer contracts. From the end of 1980, adherence to such standards is likely to be obligatory. These standards will include X-25 and high level protocol standards which are still being developed by standards organisations. A file transfer protocol is likely to be one of the standards included in the board's requirements. The board's action emphasises the growing impetus towards tying public procurement policies to the provision of standards. The EEC has a working party examining this issue (CW, May 11), and the US government is likely to stiffen existing standards requirements following a recent report by its auditing authority that government installations were wasting hundreds of millions of dollars through the lack of standardisation. And Prices Secretary Roy Hattersley told a conference on Standards and the Industrial Strategy last week, that the government is placing high priority on relating public procurement to standards, and is encouraging local authorities to do the same. In its letter to manufacturers, the Computer Board warned that from January, 1979, tenders would be judged partly according to how well they meet networking standards. Networking will be one of the main features of university computers in the next decade. The board's Network Unit, headed by Mervyn Williams at Rutherford Laboratory, is placing particular emphasis on packet switching and standards. In its plans for rationalising development of these networks.

Graham and Christine, the South West's Computastars

FOUR DP departments in the south west now have Computastars in their midst following last Sunday's regional heat, held in Bristol, of the nationwide DP sports event. The man's team from the Rank Organisation in Plymouth and one of the women's teams from Sunbeam Oil in Swindon, won the team events. The two "lonely people" who won the individual contests were programmers Graham Jenkins, of the CM & G Insurance group in Bristol, and Christine Chorley of Rank Xerox in Middlesbrough, Gloucestershire. Eleven men's and five women's teams took part in the events which ranged from cricket, billiards, and waffle boot throwing to a gruelling staples-chess at the end of the day. See page 10 for more Computastars. The winning teams and the names of the individual winners will go through to the Computastars final, to be held in London later this year. They will be joined by the runners up in the team competitions — the men of Wales Gas in Cardiff and the women from British Steel in Port Talbot, which won the men's plate competition for teams eliminated in the preliminary round. The next Computastars heat will be on Sunday, June 11 at the Croydon Sports Arena in South London. This will be followed by heats at the Wembley Stadium on June 18, Liverpool on June 23 and Birmingham on a date still to be arranged.

CIFER SYSTEMS LIMITED Computer and Ancillary Equipment. SERIES 088 Compact well styled visual display terminal features separate contrast keys, keyboard, anti-glare screen, high definition 7 x 18 dot upper and lower case character set. Standard model includes GCITT V24 and 80mA interface, 8 selectable transmission speeds, 24 lines, 80 characters, single and double line spacing, visible width characters plus 24 other selectable character highlights, video output port, cursor addressing. FROM £270. SERIES 187 Page buffered teletype compatible visual display terminal. The full ASCII repertoire is displayed as high definition 7 x 18 dot characters on a 64 x 80 page. Standard features include direct X-Y cursor addressing, line and column scrolling, single and double line editing, protected format, tabulation, customer defined character sets and keyboard. Communication facilities include baud rate/baud rate operation. FROM £700. SERIES 284 High quality page buffered terminal featuring separate 84-key keyboard including numeric and control clusters, anti-glare screen displaying 1800 high definition 7 x 18 dot characters from the full ASCII repertoire. Highly flexible in the areas of text editing, protected format, tabulation, customer defined character sets and keyboard. Communication facilities include baud rate/baud rate operation. FROM £700. Other terminals are manufactured in the UK. All models are covered by a 12 month warranty and supplied by a complete technical support and service organisation. Avro Way, Bowerhill, Melksham, Wiltshire SN12 6LP. Telephone: Melksham (0225) 702354 & 704502. Telex 449872.

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## MICHIE'S PRIVATEVIEW

Professor Donald Michie, of the machine intelligence unit at Edinburgh University, writes from Cleveland, Ohio, where he was lecturing at Case Western Reserve University.

### Results count more than haloes...

IN my childhood we were never left in any doubt by our American mother: results not haloes are the measures of things. A can opener might be of surpassing beauty. It might be based on a stunning new mechanical principle. It might be an authentic heirloom of the Romanoffs. But the abstruse question would follow: "Does it open cans?"

On my first evening here in Cleveland to lecture at Case Western Reserve University, I chanced in my TV knob-tiddling to hit on Fred Astaire in "Broadway Melody of 1940." Another world from technology — but the "halo effect" can be elicited by putting the question: "In the history of the Twentieth Century, which name will stand higher on the list of its greatest dancers, Nureyev's or Astaire's?"

So much for "halo" in the dance. Now turn to technology. In halo-conscious Britain, for how many years did we fail to read the cost-benefit writing on the wall about Concord? How long did Freddie Laker battle before he was allowed to put his proved economic at the service of Britain's trade? In 1972-73 the Science

Research Council received two reports on long-range policy for computing science and machine intelligence. The one which said "Build it up!" was the careful work of experienced computer professionals. The other, which said "Wind it up!" came from a spectacularly gifted amateur accounted with knight-hood, Fellowship of the Royal Society, and other haloes.

One is reminded of the prestigious Committee on Imperial Defence, chaired by Lord Esher, which before the 1914-18 war recommended an end to research on heavier-than-air flight and redeployment into balloons.

Esher subsequently had the grace to reverse himself. There is much halotropic nonsense to be pruned from Britain's technological garden. But we have sharper instruments than ever before. Computing is always posing the question: "Does it open cans (or calculate payroll, or predict weather, or allocate hotel rooms, or factorise large numbers, or play expert chess, or whatever the user spec happens to be)?"

British computing has always had an eye to

reliability. We must be careful not to sell ICL's veteran 1900 series short on this. In the academic world the recent achievements of Brian Randell's software research team at Newcastle are dedicated to new fail-safe and error-recovery methods. No computing research in the world is more highly respected than Tony Hoare's at Oxford, on how to prove programs correct — the mathematical side of the reliability coin.

Nor should it be forgotten that Edinburgh's computer-controlled robot FREDDY was one of the first exemplifications of a new principle of reliability, as an alternative in appropriate cases to the redundancy principle of "majority vote" logic. The FREDDY hand-eye algorithm for sorting objects out of a disorderly heap cyclically processed a small library of methods on the principle "If FAIL, then try next method."

Every good computer man will warm to the missionary in Brazil, who escaped ingestion by the local cannibal tribe when he produced and demonstrated a portable fire-lighter. The natives at once worshipped him as a god, and for years



he enjoyed a life of divine privilege. But eventually he took their chief aside: "I cannot deceive you. That fire-lighter is only a mechanical device I bought in Harrods."

"We all know that," replied the chief, "and most of us anyway have our own fire-lighters. But yours works."

I cannot close without conceding to the halo effect, to the extent of offering my credentials for pontificating on Nureyev versus Astaire. On the testimony of a mutual acquaintance I can cite Nureyev himself as sharing my estimation of the matter.

Yet Astaire, it seems, takes the opposite position, viewing himself (see David Niven's "Bring on the Empty Horses") as just a hooper.

So you can never tell with haloes. Where the game is skill, perhaps the best way is the way of American technology. After all, haloes never did win ball games.

Donald Michie

## PROGRAMMER NOTES

### Chief programmer team is key to many successful projects

WHAT comes after structured programming... top-down structuring and flowcharts, hierarchy plus input process output, diagrams? The answer is simple: teamwork.

Chief programmer teams are hardly the latest news, but lately a few moans have been heard within the programmer department complaining about lack of communication. A true chief programmer team in the IBM style has contributed to a very large extent to many successful projects.

Deliberately a team is relatively small, consisting of the chief programmer, three to five programmers, a librarian — and this position is the unusual, interesting one — and other specialists as needed. A specialist could be a teleprocessing or database expert.

The chief programmer is of a senior level and a combination of programmer and analyst. It is this person who is responsible for the development of the programming system in every respect. Duties would therefore cover technical responsibility for the project and management coordination.

The chief programmer, in a technical capacity, will assume the role of writing any highly critical code and directly specifying all the other code needed for the project as well as reviewing and overseeing the integration of all the separate program modules.

He is supported by a back-up programmer who should be not only capable of standing-in, in a technical and managerial sense, but totally familiar with the project's development status and internal technicalities.

This may seem a rather frustrating job, always the hitherto mild and never the bawdy, but it can prove more interesting if developed as a reviewing-type position. Duties could perhaps include organising independent testing or even exploring alternative programming design ideas. But in general the job entails being involved with the normal design and review work.

Team members may be assigned to programmers and could even work with more than one chief programmer team. The variable nature of projects and their estimated time lengths will necessitate occasional shuffling of staff between projects.

The last rule, but arguably the one which really makes the team succeed, is that of librarianship. This position could be filled by a secretary or junior programmer. It could make an excellent introduction to programming for perhaps a school leaver, or operator or data receptionist clerk.

After some training in JCL and basic operating system capabilities, this person will be the only one who deals directly with the computer. Responsibilities will include producing JCL, assembling, compiling, linking and making test runs. Whether this is done via terminal or on cards is dependent on the installation. Team members should never attempt to by-pass the librarian.

The librarian will also keep detailed records of amendments, versions and media results of runs and tests. So attempting to by-pass the librarian could result in wrecking the project as a whole.

Once a team is fully established, control and communication should improve. Programmers will also be freed of the possibly irksome tasks of physically organising program amendments and compiling runs. Structured walk-throughs should naturally become an ordinary occupation and not a shouting match.

IBM and many users have found such benefits as "87% of all errors discovered before testing and an estimated 40 hours of test time saved," by virtue of structured walk-throughs. Even on small projects a team can be very efficient and satisfying to the personnel involved. Readers with views are invited to write to Programmer Notes. For example, should the essentially technical role of the chief programmer actually be managerial?

## SOFTWARE FILE

### Moves on Sigma — Level 66 migration



Klee  
GCOS

Honeywell has released further details of its Control Program operating system, which forms the nucleus of its migration plan for Xerox Data Systems Sigma users over to Level 66. Shal Klee, head of the CP-6 development project (CW March 31, 1977 and January 19) was recently in the UK to talk to on InterExchange, the Xerox user group, meeting.

CP-6, the operating system for Level 66 users which will provide "the response, performance and machine interface which Sigma users had with CP-V." Klee denied persistent rumours that CP-6 will replace Honeywell's own large-scale operating system GCOS. "In the long term future, perhaps five years, CP-6, GCOS and Honeywell's Multics may merge, partially to remove the need to support a multiplicity of operating systems."

Meanwhile work still continues on CP-6 in an attempt to convert Sigma users. Honeywell's effort is partially motivated by the fact that if users did migrate to Level 66, each customer would be new to the Honeywell customer base. Even so Honeywell is still servicing CP-V customers with the National Software Support team also controlled by Klee.

Klee now has over 125 staff working on CP-6; this is due to rise to about 150. Like Klee himself many some from the original XDS CP-V team. Slight delays now mean the first UK deliveries of CP-6 will be in late 78. The first release will contain remote batch, timesharing and local batch, the second release will concentrate on real-time and transaction processing, but the third should be the final tuned version.

### 'Fully transportable' is claim for language

A COMPUTER language, which purports to eliminate the need for conventional programming, has been launched in Melbourne, Australia. The language is not only claimed to be fully transportable between hardware but also capable of cutting programming time by up to 80%.

The managing director of Excalibur Management Consultants, Stuart Evans, has taken over seven years to develop his Pnol, Welsh for "people," and Evans claims to be two to three years in advance of competitors. Excalibur has held seminars and demonstrations in Melbourne to a number of computer hardware suppliers.

The launch is aimed at convincing a supplier the product works and selling exclusive world rights. If the language did perform as claimed, a supplier could reasonably expect a substantial number of orders.

Pnol has been designed as an easy to learn and use language using natural spoken-word constructs. Because it is the end-

user who writes the code, programs should be cheap and easy to maintain. Programmerless languages are not in themselves new, but the concept of portability is. Allied Business Systems markets its Simple language concept on its own hardware.

Like Excalibur, ABS has no intention of revealing the internal workings of Simple, but admits Simple is probably portable. The US-based Logical Machine Corporation markets a similar language/hardware package, Alsim.

ABS says that while it has heard these claims of fully portable programmerless languages before, logically there is no reason why Evans should not have developed another Simple.

In stressing the need for a large support team for true portability and the need for field experience, ABS said it has 50 Simple sales in the UK and overseas.

John Eidsen, software director at ABS, pointed out "for such a language to succeed it has to

be more a concept than a compiler-type approach. It would be vital to know exactly where Pnol has its intelligence."

Evans and Excalibur were unavailable for comment at the time of going to press.

### Users told of revised plans for Q-Pac support

THE Q-Pac payroll package, used by nearly 100 UK sites, is to be supported by a separate company from its marketing agents, Package Programs Limited.

The announcement was made at the annual general meeting of the Q-Pac users' association held in Coventry. It follows rising criticism from the association of a delay in technical support from PPL.

Members of the association felt that PPL had outstripped its sales in the UK so far that its technical support team could no longer keep up with queries. Periods of two to three days delay were reported. PPL said it appreciated the delay was too long and apologised for neglecting to inform customers of progress on queries.

But the new technical support arrangements should not only solve the delay but also help in gear the package directly towards the UK market. Q-Pac has its origins in South Africa where it is still actively marketed and supported. It is thought that some South African personnel will initially join the support company, Q-Pac Services Limited, in London.

Some members were sceptical that the new company was just a way of delaying support until October 1, when the agreement between PPL and the South African company becomes effective.

However it emerged that Q-Pac Services is not a new company but was in fact originally set-up in 1970/1 when Q-Pac was first marketed in the UK. Once PPL began marketing operations, Q-Pac Services remained an associated, but dormant, company.

Roy Taylor, chairman of PPL, was adamant that Q-Pac Services is not merely a ruse to delay correct support measures. "Steps are already in-hand to improve the support and for example we have now a Q-Pac support desk which is always manned."

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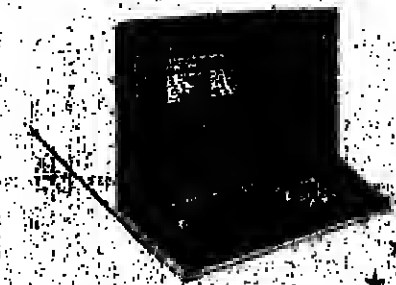
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### Care is needed when relying on one critic's view

RECENTLY, the BCS Algol specialist group sent a book to three of its members to review. The difference in perception of the three reviewers makes an interesting example of the care that should be taken in relying on one critic's view. The book under review is "An Introduction to Algol" by F. R. Watson, published by G. Bell & Sons, price £2.50.

The group's secretary, Brian Bailey, thought:

● I do not like the many forward and backward pointers within the text — p2 line 6 (p282). It indicates that the book has been badly thought out.

● Large number of exercises with answers — good, but too many are mathematically based.

● Flow charting — only standard seems to be to cram an example on to one page.

● Very simplistic view of Algol not really getting over the major principles of the language. One feels that the examples could be written with very little loss to the reader in Fortran or Basic.

To conclude, my only major reservations are the first and last. Otherwise students should find this a suitable primer to make the transition from classical mathematics to simple computer programming of mathematical exercises.

Committee member Nick Rushby commented:

● Although the title does not make it clear, this is a book about Algol 60 and not a later derivative of that language. I like the general approach of the book, through flowcharts and program reading, but feel that this could have been developed to greater advantage by incorporating some of the philosophy of structured programming.

The idea of a hierarchy of flowcharts (program structure) is only hinted at, and then not in such a way that students are likely to adopt it as good practice. In principle, the practice of delaying the explanation of the final points is good, although the resulting plethora of optional goto and come from statements can make it difficult going for a vacillating student.

I regret the mathematical bias, but realise its inevitability since the book was written to be implementation independent, while the character and string handling necessary for non-numerical work are not. The level is right, and the price (£2.50) acceptable for the target readership.

However as a contrast the Algol specialist group's chairman Richard DaMorgan concluded: I found this less an introduction to Algol than a book on elementary programming which could perhaps, alas, have used Fortran.

Terminology is often poor. For example, the author speaks of "subroutines" without explanation, then states that in Algol, they are called "procedures." Other examples are "transfer statements."

As for its coverage of Algol, bookends are not mentioned, except as a footnote on p 48; procedures are treated very scantily; there is a superfluity of semicolons; also is introduced too late, therefore many examples have too many labels. Identifiers named are in general, unimaginative.

The use of Algol without explanation of its non-standard non-procedural input-output schemes is unfortunate.

Some of the language independent presentation features are good — symbols in boxes avoid confusion. Flowcharts, if suppose are inevitable, but were done well.

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### SIA re-introduces its Paris service

WELL-KNOWN for its CDC capability, SIA has re-introduced an IBM service, based on private 2,400 baud lines to a 5 Megabyte IBM 370/168 operated in Paris by the parent company, Ciel.

SIA facilities, including a communications multiplexer and an RC 3600 RJE station, enable users to access the IBM system remotely, in either batch mode, or to submit "over-the-counter" batch jobs.

SIA sales manager, Peter Sinclair, emphasised rapid turnaround as a major competitive feature of the new service. The large Paris configuration, running under MVS and TSO, would appeal, for example, to those wanting to offload urgent development work from similar in-house systems.

SIA first implemented a link in Ciel's IBM network in 1976, to add a capability for APL

(CW, May 13, 1978). However this project met with limited success, partly because the communications equipment was unable to accept terminals using the special APL-language characters.

An APL Interpreter was subsequently implemented on the CDC machines and the 370 service was dropped during 1977. The link between the London and Paris nodes also enables European users to access SIA's London CDC system.

### Algorithm journal

THE Algorithm Section of the journal "Applied Statistics" is now available as a separate magazine, costing £3 a year for three issues. The magazine is published by the Royal Statistical Society, which can also supply back numbers going back to 1968.

Here is a mnemonic which gives the correct Christian-Turk positioning — If only you can work out its secret! "From numbers" aid and art, never will tame depart."

See page 53 for solution.

### Puzzler

ONE of the classic problems of ancient times was the Christian-Turk Circle, wherein 15 persons of each religious persuasion found themselves beset by the elements on board a ship sailing to the Holy Land. The storm reached such a height that the captain decided to throw 15 of the 30 passengers into the sea, to lighten the vessel. He asked them to form a circle, and announced that he would count to nine round the ring from a certain point: 15 times, eliminating the ninth per-

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July 1978







# Keen competition in the North East

A GREY, rainy morning gave way to a brighter afternoon as the North-East heats of Computastars, held at the Nab Wood Sports Centre, Bingley, Yorks last week turned out a great success.

The nineteen men's teams, each of five members, braved the elements of the morning to entertain the spectators adventurous enough to join them in the open, and the more cautious who watched from the relative comfort of the marquee.

Competitors took part in five events: penalty kicking, putting the shot, projecting a frisbee, performing press-ups and stand-ups, and sprinting.

At around 2.00 pm, the finalists emerged as PMSL 1, Rowntree Mackintosh 2, the 600 Group, Platt Saco Lowell, Bonta, Reckitt & Culman 1 and British Railways. The non-qualifiers took part in a men's plate competition.

The ladies joined in the fun at about 2.15 pm, with seven teams participating. In Computastars, the ladies' teams have three members and two reserves, if so desired.

They took part in events including netball, throwing the cricket ball, sprinting, and racing. The cricket ball throwing was great fun but pretty hazardous, as when Debbie Simpson, of Woolworth, using a curious under-arm technique somehow managed to throw the ball behind her, scattering the spectators.

Anyway, everyone survived, and at around 3.30 pm Woolworth clinched the ladies' team title, with the individual award going to Sheila Watson of Midland Bank, Sheffield.

The men's competition went on and on into the evening, until just before 9.00 pm, when

Rowntree Mackintosh 1 won the contest, with the individual title also going to their number one seed, Martin Rigby.

So, the qualifiers for the final to be held in London sometime during September are, from the men's competition: Rowntree Mackintosh 1, runners-up Platt Saco Lowell, PMSL, and Midland Bank. And the winners of the Plate competition. The qualifiers from the

ladies' competition are: Woolworth, Midland Bank Sheffield and PMSL 1.

For the uninitiated, Computastars is a nationwide competition organised by John Goldsmith Services and supported by Computer Weekly, and is intended to test the all-round sporting ability of computer staff. Each men's team has five seeded members, and each ladies' team has three.



"Catch me if you can." Martin Rigby of Rowntree Mackintosh 1 on his way to winning the 100-yard sprint and the men's individual title.



"The show must go on." Two ladies defy the adverse conditions and impress the spectators with their strength and endurance by performing some press-ups.



Is this the latest in ladies' fashion? No, it's Sheila Watson (left) of Midland Bank, Sheffield springing her way to victory in the shot race and the ladies' individual title.

## Sponsors

The North-East heats of Computastars were sponsored by Provident Management Services Ltd, the computer bureau based in Halifax. It was a great success, thanks largely to the hard work put in by a number of the bureau's employees. Gordon Cairns of John Goldsmith Computer Services, and several of Cairns' friends.

Anyone who wishes to help in the organisation and running of the other regional heats should contact Gordon Cairns at John Goldsmith Computer Services.



Any one who wishes to help in the organisation and running of the other regional heats should contact Gordon Cairns at John Goldsmith Computer Services.



The winners of the women's team title, from left to right: Jean Barlow, Debbie Simpson, and Linda Kenworthy.

## PEOPLE

### Board appointments at Racal Datacoms

THE recently formed Racal Data Communications Group (RDG) has made two more appointments to its board.

Darryl Sturtford, already a director of Racal-Milgo Limited since it was formed in 1980 when he came from STC Data Systems, is now appointed technical director of the new company. Sturtford is a member of several CCITT study groups and is this year's chairman of the Electrical Engineering Association.

Peter Hare moved from ICL in 1975 to be marketing manager of Racal-Milgo with particular responsibility for selection of products complying with CCITT requirements. He is now appointed director of product strategy for the Racal Data Communications Group.

Meanwhile at Racal-Milgo Limited, marketing director Ron Allatt also becomes deputy managing director. He has been a director of the company since joining in 1980 after 15 years with Solartron, where he moved from sales engineer to general sales manager.

Three others join him on the Racal-Milgo board. John Blackwell, formerly product engineering manager, becomes engineering director eight years after joining the company as a product engineer.

Operations manager Derek Fones becomes operations director responsible for the company's manufacturing and distribution facilities at Hook, Hampshire. And Malcolm Henna becomes sales director after eight years with the company in various managerial sales positions.

Colin Ginzendine, a sales executive with United Datacom, has been named as regional sales manager for Northern England.

Ian Guthrie, Minister Assistant, has been promoted from site executive to London regional sales manager.

Ian Muckenzie has left Stirling Computing Centre, where he was senior systems analyst in the national control department, to join SIA's industrial systems group as a senior NC consultant.



Mike Harvey, president of Interline at Burlington, Massachusetts, joining Interline, he was president of the US Group at Diversity Computing Company, Dallas.

David Baw has been promoted to head of the Southern region, senior territory manager for central and south. Simon Shaffer has joined as territory manager for the government branch, from CMC, where he was a senior consultant.

Fred Pritchard of Honeywell, previously Midlands branch marketing manager, has been appointed manager of the Midlands branch.

Ron Goodman, sales executive, has joined Interline Regional Sales in London.

Roger Smith, general manager of MPT Computers, has been appointed director responsible for systems. Kingsley Stock joins MPT as a marketing consultant, from Compaq Systems where he was a systems consultant.

**Glenrothes development**

EDINBURGH, Scotland, consultant Robert Watt has been appointed deputy chairman of the development corporation of Glenrothes in Fife. He has his own consulting business and is a Fellow of the BCS having served on its council and Scottish representative. Last year he was awarded the Queen's Silver Jubilee Medal for his services to Glenrothes.

DIARY is on page 12

## OP SPOT

# Skills of operators untapped

DP MANAGERS often fail to make the best use of the skills of their operators. This leads to discontent and unrest among the staff, who feel that they have no real career path and that their potential is not appreciated and therefore wasted.

It is time for operations staff to take the initiative and to make practical proposals on the organisation of the DP function,



French... "Too many operators are just interested in getting home early."

the development of technical skills and training, in order to raise the status of the operation function.

These were the main points to emerge at a meeting of the Cen-

tral London branch of the Data Processing Management Association last week, at which operations staff had the opportunity to air their views.

Ron Linton, computer operations controller at Manchester Polytechnic; George Stevenson, a contract operator; and Mike Rees and Dave Charles of Opcomm were the four operations staff who addressed the meeting.

All were clearly concerned about the manner in which DP managers fail to recognise, or just ignore, the ability and skills that exist within operations. In this context Dave Charles said, "The industry makes little or no attempt to use the latent skill and ability inside the computer room."

In the same vein, Mike Rees pointed out that, "It is almost as if the DP manager is frightened of seeking opinions from the untapped knowledge and experience of his team of operators."

Ron Linton said that "operators are rarely given the opportunity to demonstrate their capabilities," but named a site where the situation is different, with impressive results.

At Perovo, the operators are entirely responsible for the George 2 operating system, having installed it originally. None of the programming staff

## DPMs' criticisms answered

DP MANAGERS often make remarks like these about operators, said Ron Linton:

- 1) "Operators are the least important members of the DP department — programming and systems are the real productive element."
- 2) "Operators have an easy life."
- 3) "Operators shouldn't try to sort out problems with jobs because they don't understand them."
- 4) "Operators can't be worth much, otherwise they would be paid more."

He added that most operators are left to their own devices to acquire the skills of the job — the lucky ones getting someone within the department to help

them while the less fortunate are left to "muddle through by themselves."

Other speakers and members of the audience made comments about career progression. Jack French, who is operations manager at the Bishopsgate site of the Bank of Belgium said, "There are many operators who are not sufficiently interested to become involved in technical matters. Too many are just interested in getting home early."

But French added that there are many areas in which operations and programming overlap and that the operators with sufficient interest and motivation should look to move out of operations and into technical support roles.

George Stevenson agreed about the overlap, but said that DP management should accept a broader definition of operations rather than move staff from the department. He added that operators and programmers should be encouraged to work together and that they have

5) "Operators have no interest in their work."

Here are Ron's reactions to those statements:

- 1) "Today many of you are running a race to the payroll. Which would have the most effect on the production of that payroll — a walk-out by your programmers, or a walk-out by your operators?"
- 2) "How many managerial staff are capable of running around a machine room, leading tapes whilst the printer is pouring paper over the floor, in modern

is ringing for attention and the console is chattering for operator action?"

3) "Operators exist not just to run jobs but to produce results — they cannot achieve this without thinking."

4) "Pop singers regularly make £1,000 per week, nurses about £50. If you have a broken leg, who do you want — Phil McCartney or a nurse?"

5) "How can operators be expected to be interested when their employers take the above attitudes to them?"

John Aske, a senior operator at NCR's site in Brent Cross, London expressed disillusionment at the attitude of DP management. He said, "Until you reach the level of shift leader no-one in management even considers your career path."

Miko Rees said that one of the great causes of resentment among operators is the fact that the majority of DP managers are drawn from systems and programming — with operations being almost totally overlooked.

George Stevenson agreed about the overlap, but said that DP management should accept a broader definition of operations rather than move staff from the department. He added that operators and programmers should be encouraged to work together and that they have

He added that when contractors

RELATING some of his experiences as a contract operator, George Stevenson pointed out some of the difficulties he faces moving from one site to another.

Of DP managers he said, "If DP managers had their installations organised and running in the correct manner contract staff, like myself, would not be necessary."

He added that when contractors

go to a site their experience is often wasted by the "short-sightedness" of the DP manager who puts us on peripheral work almost immediately.

He also pointed out that "permanent staff are sometimes resentful of the fact that we earn more than they do" and added, "They tend to forget that we do not get sick-pay, holiday pay or a pension."

The SYSLOG is written to the output queue by use of the following OS command:

"W OUTPUT CLASS"

"The operator should ensure that the SYSLOG data is written to an output class which is not used by other work at the installation, and that at least one of the printers gives priority to that class. In this way it will not be left waiting on the output queue for an excessive length of time."

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## HINT OF THE WEEK

### Use of the SYSLOG

THIS week's hint relates to the use of the SYSLOG in the OS and OS/VS1 environments.

If the system is particularly busy, such as when a lot of machine time is allocated to testing work, the job control section may be inundated with inquiries as to the whereabouts of users' jobs.

In these circumstances, as an aid to the person looking for the users' jobs, it is a good idea to get the system log printed every hour so to provide a recent record of the throughput of the system.

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## Liveware File by Don



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## Warning on second - source 'incompatibilities'

A WARNING has been given in the US about the existence of "incompatibilities" in microprocessors and memory components being offered by companies which claim to be second sources.

It came from Nicholas D. Besser, a computer systems engineer for General Electric's Space Division, during a presentation at a microprocessor applications conference in New York.

"There is a difference between a second source and a second source licence," he said. In particular, he referred to the 8080 series of microprocessors now being offered by a wide range of vendors. "Some of these have produced a performance copy rather than an actual hardware copy," he said, pointing out that some devices have differences in

such areas as the status register from the original Intel part.

He indicated that software written to run on the Intel 8080 may not always run on some of the other versions.

"Such second source incompatibilities were also to be found in other components, such as memories," he said. As an example, he compared the 2716, 16K EPROM from Intel, with the 2716 from Texas Instruments. While the Intel part requires a single +5 volt power supply, the TI device needs both +5 volts and +12 volts to be operational.

Besser pointed out that, while each part had its merits, a design with one of them was a total design commitment. "If you go to your purchasing manager and ask for a 2716, you had better tell him which one, or you may wind up with problems," he said.

## 102 games to play

ONE hundred and two classic computer games can be found in a new book from the publishers of the US magazine, Creative Computing.

Edited by David H. Ahl, the 200 page Basic Computer Games contains all the popular games, including super star trek, football, blackjack, lunar lander, tic-tac-toe and horse races. They are all written in standard microcomputer Basic.

The book is being imported into the UK by LP Enterprises, and will cost £5.50. LP Enterprises is also offering subscriptions to the Creative Computing magazine, at £5.50 per year.

## Course for managers

A TWO-DAY course, "Managing with Micros," is being planned by Bleasdale Computer Systems for company directors and managers who are becoming involved with microprocessors.

To be run in association with Motorola Semiconductors, the course will have two main objectives: to highlight the effective use of microprocessors, and to give an understanding of how to manage a micro-based project.

It will take place at Ascot on October 5-6. Details: Bleasdale, 32 Eastways, Morden, Surrey.

## Cheaper 4051 terminal

BY lopping £1,000 off the price of the 4051 graphics terminal, Tektronix has pushed the system into the top end of the mainstream price bracket for personal computers at £3,821.

It is based on the Motorola 6800 micro, and is available with between 5 and 32K bytes of memory, together with 300K byte tape cartridges. The software is Basic, and this, together with the operating system, is held in 32K bytes of ROM.

It uses the IEEE standard 488-1975 bus interface for connection to peripheral systems.

One of its most important features, according to Tektronix, is the in-built graphics capability of a system designed initially for the professional market.

## Michie takes Cogar to task on robotics

IT is disturbing to find the column of a respected stablemate, George Cogar, overflowing with horse-fentlers, "Robotics," we told, "as well as being fashionable in an old-fashioned use for fund-raising in Academic world-wide." (Cogarview, April 10).

The pioneering work in computer-controlled robots was conducted in Aachen, by laboratories directed at MIT by Minkey, at Stanford by McCarthy, at SRI by Rosen and Raphael, and in Edinburgh by myself.

Far from these studies being wily fund-raising ploys, robot work in all these places had mainly to be moonlighted. In the United Kingdom the topic became so unfashionable that in 1973 the financial rug was pulled from under, and the wave of official robot-zapping spread for a short time even to the American agencies.

In the aftermath, the public spending by the UK on academic robotics now runs at not more than £50,000 a year for all the projects in Britain combined! Against such a background any academic who uses robotics as a fund-raising ruse is scarcely to be called "wily." Plain "nuts" would appear to be more appropriate.

When it comes to accuracy over numerous small facts, Cogarview performs a drunken's walk through a china shop. Thus, Berkeley's robot is not "working," the Unimate robot was developed by Unimation Corp, not Stanford. Its main

## LETTERS

employment is not "lifting weights" but spot-welding. Artificial intelligence is not confined with "bizarre medicine."

Rather than attempting to collect all the little pieces to the glue-pot, I would, Cogar, and all interested readers, to seek information from the British Robot Association. They should write to Professor Wilfred Heginbotham, the Department of Production Engineering, University of Nottingham.

On immediate aspects of government industrial policy the recent report of the Department of Industry's autonomous small batch production committee can be consulted. In addition the papers presented last month at the National Engineering Laboratory's colloquium on robotics may be requested from that Laboratory's computer-assisted manufacture division, East Kilbride, near Glasgow.

DONALD MICHIE  
Machine Intelligence Research Unit,  
Edinburgh University.

## Input errors—first identify your text

I WOULD agree with all that Tom Gilb says about input error correction (Mythology, April 20), but he is dealing only with structured text where numeric and alphabetic fields can be identified separately and many job-oriented data entry routines can be included in the program.

My concern has been with the input of complex text strings for computer typesetting where it is almost impossible to write data entry routines with general application to the text strings, but it is possible to indicate some style errors.

It is now normal for interactive VDUs to indicate the operative text style by means of status lines on the screen when the operator can check that he is entering text in the correct type size, measure and format, and many systems will show the text on the screen in justified lines. The next stage is the display make-up terminals with interactive control of displayed advertisement composition.

A great deal of programming effort has been spent in detecting input errors in layout composition. I would suggest, however, that it is dangerous to write error correction routines to detect "Tom Gilb" or "Gibb" and correct them; it might be correct "Gibb" as a writer, but the person referred to in someone's entirely different computer-aided composition because of the limitation of the internal code of the computer compared with the printer's character-set. Although efforts have been made, and are continuing, to provide a standard representation of all the characters available to the printer, the result is most likely to prove too cumbersome to handle when only a small fraction of all the available special characters are needed for any one job.

ARTHUR H. PHILLIPS  
Exmouth,  
Devon.

## UK minimakers take 37% of market

A RAMBLE through the new edition of the Podder Associates Survey of United Kingdom Installed Computers makes fascinating reading. It is Podder's fifth annual survey of the industry and goes up to December 1977.

Among the notable figures are the 37 per cent of the market allocated to UK minimakers.

An important point to remember with the figures is that all installed systems are valued by Podder at the current selling price of the system, or, if the machine is obsolete, at the last sale price before the model was withdrawn. In contrast, IDC depreciates all system values according to age.

Now that ICL has started delivering 2900s in quantity, its share of the market has fallen from 37.7 per cent for 1976 to 35.4 per cent, with IBM moving up from 37.1 per cent to 39.4 per cent. However, Podder notes that several high-value 2900s have been delivered but not yet accepted by customers, and therefore do not show up in the figures.

In the mainframe market — and for Podder, ICL 2904 and IBM System 3.10 count as mainframes, but 2903 and System 3.18 do not — Honeywell is No 3 with 8.8 per cent of the market, followed, surprisingly, not by Univac but by Burroughs with 8.4 per cent.

Univac has 4.9 per cent, CDC 1.8 per cent, NCR 1.4 per cent and DEC 1.1 per cent. Burroughs' strength lies in the 81700 small system and the mid-range 27-37-4700 lines, but the company is now shipping several 86800s and "800" series mid-range replacement machines, so it can be expected to advance further in the current year.

Old machines figure surprisingly strongly. There are apparently several old Fortran machines including 18 Polesons, three Homers and one Apollo still running. Honeywell's base is still full of pro-series 80

machines, and there are six IBM 1400 series machines in use.

Turning to minicomputers, the rash of recent arrivals on the UK market like Prime, Harris and IBM with Series 1 have opened up the business and after DEC, only two other suppliers have more than 10 per cent of the market. Surprisingly, both are British.

DEC leads the field with 28.3 per cent, then comes GEC Computers with 17 per cent, and Ferranti, whose Argus machines have won a 10.8 per cent share of the market. World No 3 Data General comes in at fifth place with 8.1 per cent, behind Honeywell, 8.6 per cent.

Another British company, Computer Technology, comes next with 5.3 per cent. General Automation has 4.5 per cent, Computer Automation 2.3 per cent, Perkin-Elmer Interdata and Prime each has 2.2 per cent, Univac-Varian 1.9 per cent, Texas Instru-

ments 1.8 per cent, and Leigh Data (formerly Arctural) 1.4 per cent.

World No 2 Hewlett-Packard has a lowly 1.1 per cent, and Digilog 1.0 per cent. Altogether, UK minimakers as defined by Podder have a surprisingly high 37 per cent of the total market.

In the small business systems market, basically machines supporting terminals and costing £20,000 to £70,000, the 2903 makes ICL the runaway winner.

ICL's 29.8 per cent by value (including System Ten) is almost exactly three times the share of the next contender, Burroughs, with 9.8 per cent.

Fifth Annual Census of United Kingdom Installed Computers, 21 December 1977. Price: £400 complete, or £110 for each section. Available from Podder Associates Ltd, 51 Portland Road, Kingston-upon-Thames, Surrey KT1 2SH. Tel 01-549 9211.

## Rapid Recall to be DEC distributor

TO achieve greater penetration into the low volume end of the microcomputer board market, Digital Equipment has broken away from its normal marketing philosophy and appointed Rapid Recall, a specialist microprocessor distribution house, as a franchised distributor for the LSI-11/2.

One of the main reasons for the move is that DEC has been confronted with the same problems as those faced by component manufacturers before them (and which have led to the rapid growth in the business for component distributors).

These problems revolve around the sheer cost of processing the volume of small orders being received.

Rapid Recall already handles Intel and Intersil microprocessor components and board systems, and had a turnover last year of £2.5 million.

It has taken on-board an initial stocking order of LSI-11/2 valued at £100,000.

Laker opts for ICL in New York

LOW-COST air travel pioneer Freddie Laker is staying with ICL for his computer requirements in the US. Laker Airways already runs a 2803 at Gatwick, and has just ordered an ICL System Ten 220 for its New York Rego Park Travel Centre. The machine, costing \$135,000, will support terminals at Kennedy and Los Angeles International airports for installation in June.

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**PIX**



Minimakers were out in force at Compe Europe, and in this second look at the equipment on show, TIM PALMER examines the latest offerings from several of the leading companies.

## Showcase for minimakers

THE annual Compe Europe exhibition provides perhaps the finest showcase for US and European minicomputer companies, and this year's event, held in Brussels earlier this month, proved no exception. Digital Equipment showed the PDP-11/60, Hewlett-Packard stressed the strengths of its new fast 1000 series processors, and Texas Instruments promoted the new DS-990 package for the OEM systems builder.

Modcomp put the Classic 7860 on show, and even a brief examination of the machine shows that it has much more to offer than a reskinned cabinet with bold orange and yellow stripes.

The use of high density chips not only cuts the cost of production but also improves both processing and input-output speeds. However, Modcomp remains committed to its traditional use of wirewrapped joints and plug-in semiconductor components. Cooling requirements have been much reduced so that operating temperature never exceeds 5°C

above ambient. As a result the Classic has already passed stringent military specifications.

Modcomp has completely redesigned the Modcomp IV 32-bit processor using that ubiquitous chameleon, the 4-bit AMD 2901 bit-slice chip. The Classic features variable word-length, offering 8, 16, 32, 48 or 64-bit working, and Modcomp offers a complete instruction set for each word-length. Other features include one or two dual input-output processors and a floating-point processor, and a complete rethink of security, reliability and ease of servicing facilities. Even so, the

Classic is fully software compatible with the earlier Modcomp minis.

At the top end of the scientific market, Norsk Data is the leading European minicomputer company by virtue of its formidable Sitrax III operating system. The company suffered somewhat by having a stand bare of equipment, but representatives were on hand to promote the merits of the new Nord TPS transaction processing system, which integrates the Sitrax operating system, the Sitrax database management system and Norsk communication facilities into one package.

The Nord range of minicomputers covers the DEC PDP-11 line from the 11/34, through the 11/70 and the VAX-11/780 to the DECsystem-2050. At the top end the increased performance is achieved by using the Nord-50 32-bit back-end processor.

The Norvegin company has one system in Belgium at present, at the University of Liège, where it is used to control a cyclotron, and it will open a Brussels office later this year. New markets sought by the company include distributed database city administration systems and advanced banking applications.

Minicomputer highlight of the show was the new Modcomp Classic 7860 computer in orange and yellow stripes, which attracted considerable attention from the 5000 visitors to the three-day event.

New from General Automation is a doubling of the memory capacity on the 16/220 microcomputer to 64K words, making Cobol compilations a practical proposition for the first time, and the addition of a MOS memory option on the 16/440, which thus becomes the 16/460.

British sensibilities persuaded Harris to drop the name Slash for its line of 24-bit processors. The current Harris processor is now simply the Model 6, and forms the basis of the System 100 family, all of which run under the comprehensive Vulcan operating system. Vulcan supports simultaneous multiple batch streams, interactive time-sharing and multiple remote job entry to different mainframes, and also allows eight different language compilers to be used simultaneously.

Those available include Cobol, Fortran, RPG II, Basic, Snobol, Fingo, which is a diagnostic Fortran, and APL, which will be announced formally next month.

The difference between the three models, the 115, 125 and 135, lies in the number of users supported. The 125 is the workhorse of the range, and supports up to 30; the 115 takes eight and the 135 up to 120. Maximum memory capacity is 250K words, and the 125 offers one Megaword of virtual storage, and the 135 four Megawords.

Traditionally a scientific and engineering machine, the Harris system has made an almost clean sweep of engineering companies in Holland, where only one of the big companies bucked the trend and went to another supplier. Options for this market include a double-precision back-end floating point processor, and the Harris machine competes with the DEC PDP-11/70, the VAX and the HP-3000.

Like most of the minimakers, Harris is moving into the commercial market, and has installed a system with NRV Holidays, the biggest Dutch tour operator.

The Compe demonstration showed simultaneous Cobol processing, with a Fortran stress analysis package and interrogation of a Total database.

Perkin-Elmer Data Systems has turned to the AMD 2901 chip for the low-cost Interdata 5/16 mini, and is going head after the IBM market.

It claims 90% software compatibility with IBM 370 on its 32-bit machines, and reports that OEM customers in the US are adding microcode to the Interdata 7/32 and 8/32 to make them 100% compatible with IBM.

SEMS Solar line is much stronger in Belgium than the Mira line, for historical reasons, so the French minimaker concentrated on the Solar 16/40, combining the Muxex multi-transactional exchange operating system, one of seven offered on the Solar 16 line.

The Solar machine offers up to 16 Megaword of main memory, and microprocessor systems up to 16/40 are supported.

## French aim for £150 telecopier

IN an effort to promote the widespread use of facsimile as an alternative to mail, the French government is trying to encourage the development of a very low cost telecopier for mass use.

The price the government has in mind is about 1,500 Francs (£150), but Sévère, the only French manufacturer of an automatic telecopier, is sceptical of the feasibility of this.

As a first step to promoting the swing to electronic mail, the French PTT has ordered 2,000 of Sévère's S360 fax machines for its own internal network.

## School for scandal

THE proprietor of a computer training school in Detroit has been charged with defrauding the US government of money obtained as grants for needy students. He has already lost a civil action brought by the government to recover the money, and now faces criminal charges.

Henry Borcherting, founder and owner of the National Computer Technology, submitted 2,000 applications for grants from recipients of welfare benefits who wanted training in key punch operation, computer operators, and programmers. Under the Federal Government's Small Business Opportunity Grant Programme set up in 1972, Borcherting was said to have received \$380,103 before moving to and changing the names of the students named in the classes were never held.

## Small systems for small countries

SMALL computers for small countries is the theme of the British Computer Specialist Group for Developing Countries meeting in June in Hanoi, recently returned from a tour of the Indian sub-continent and Frank Land, a lecturer at the London School of Economics, will speak at the meeting, to be held at LSE on June 14, starting at 6 pm.

Another meeting in July at the same time and venue will be devoted to SCAPA, a system designed for the application of computers to rural development.

## Amdahl opens Irish plant

FORMAL opening of Amdahl European manufacturing plant in Dublin took place yesterday Wednesday, at a ceremony performed by Dr Gene Amdahl. The plant is in the Dublin suburb of Glanavin, but is to be transferred to another suburb, Swords, next year.

Amdahl now has two 470 V6s installed in West Germany, 10 in Switzerland, two in Norway and one each in Italy and France. There are also V6s in Denmark and the UK.

## Classic models

THE next models in Modcomp's new Classic line are set for launch on July 18, says US sources. The new models offer more power than the Classic 7860. The other will be a smaller low-cost machine to replace the Modcomp II. The Classic processors are built from AMD 2901 four-bit bit-slice microprocessors.

Computer scientist Professor Ewan Page has reached one of the top rungs of the academic ladder with his appointment

as Vice-Chancellor of Reading University. Here RORY JOHNSTON assesses the role of Professor Page — "a man

with a relaxed manner and a cherubic grin" — in firmly establishing computer science as a respectable discipline.



EWAN PAGE... "to be accepted by the Georgies as a local is quite an achievement."

## Computerman who reached the top of the academic ladder

FEW institutions in Britain are more surrounded by tradition than the universities. Caps and gowns, the rituals of centuries, and the ghosts of William of Wykenham and Lady Margaret Beaufort can easily make someone from such a brash, upstart discipline as computing feel totally out of place.

So it is a notable moment in the development of computing as an academic subject when a computer scientist first reaches the topmost rung of the academic ladder, as Professor Ewan Page has done in being appointed vice-chancellor of Reading University.

If computer science is now firmly established as a respectable discipline it is due in no small part to the efforts of Professor Page, who for the past 22 years has been developing the computing at what used to be King's College of the University of Durham, and is now Newcastle University.

Starting as a lecturer in statistics, he was instrumental in starting up both the computing service and the academic department at Newcastle, which he now heads.

Indeed, he was one of the pioneers of British university computing in both these respects.

Originally a mathematician, Professor Page's first brush with computers came at the statistics laboratory at Cambridge, where there was an Edsac 1. He took his bachelor's degree and doctorate at Cambridge, and then moved North to Durham, thence to Newcastle, where he has been ever since.

The first computer at Newcastle was a Pegasus, installed in 1957. This was one of the first

batch of computers actually bought by universities, rather than built out of "string and sealing wax." It was eventually sold to Parsons, the engineering firm, and replaced by a KDF8 in 1963. Newcastle is now firmly established as an IBM user, with a 370/168 and a 360/67 — and a sizeable reputation throughout the UK as a source of innovation, particularly in online retrieval.

Professor Page was determined from the start not to separate the computing service for the university and the teaching department, as is done at many universities. He regards computing as being part way between a pure and an applied science, with his own personal inclination lying in the middle of these two; and he felt it was important for the service people to remain close to the consumer of the product. The cross-influence between the two groups, he feels, is a good stimulus for both.

The flight to establish computer science as a respectable intellectual discipline and not just a craft has been one of the principal concerns of Professor Page's career. From the start this was helped by Computer Science being set up as a department on its own at Durham University, and not a department of King's College, but it was still a long struggle to attract able students and institute a good postgraduate department, by manipulating the computer curriculum around those of the more established subjects.

A measure of Professor Page's success can be seen not only in the computer science degree courses, but in the subjects taught for other departments. Computing is now taught in every faculty in the university except Law. All engineers and most scientists now study it, as well as many students in the arts and accounting.

Newcastle has made a name for itself in several areas of computer research. The Medium

system for online bibliographic information retrieval provided the first access to this county to Medlars, the American medical database.

More recently, Professor Brian Randall's project on fault-tolerant software has received the British Computer Society's award for technical achievement.

Work is also being done on programming methodology and computer-aided design of software, and a joint commercial venture has been set up with CAP to produce software for microprocessors, and possibly even design new micros.

As for establishing the status of computing with the public at large, Ewan Page declares himself not to be a campaigner. He is concerned, however, with the issue of professionalism. He feels that many people drifted into computing without formal training and lacking a broad enough base of knowledge to adapt to changing technology. A high degree of flexibility of

approach is needed in computing, he feels, and a programmer needs to be trained to tackle a wider range of problems, and to be aware of the many different solutions there may be to the tasks facing him. This is a natural enough attitude for a man who has spent his life teaching computing.

A man with a relaxed manner and a cherubic grin, Professor Page lets it be known that one of the proud moments for him was when a Newcastle paper headlined the story "Northern academic wins new post." To be accepted by the Georgies as a local is quite an achievement — even after 22 years.

The switch out of computing to dealing with the weighty problems of university administration will not be too much of a shock; he has been pro-vice-chancellor at Newcastle for the past six years.

He hopes, he says with a smile, to be invited to give some lectures at Reading, if he has the time.

## NEWS IN BRIEF

### Good connections

THE Cross-City Line in Birmingham, a new rail-link running from Loughbridge to the South-West to Four Oaks in the North-East, is making use of advanced technology in its signalling and communications.

The main signal box at Saltley, and three ring boxes have been equipped with 4M control systems from Vaughan Systems and Programming of War. The system is based on modules using the TMS1800 series 16-bit microprocessors from Texas Instruments.

### Increased profit

FOR the six month period to the end of January, Kalamazoo reports a gross profit of £1.27 million, an increase of 11 per cent over the same period last year, on sales of £9.9 million, which were 21 per cent higher than last year. Its computer services division accounted for 25 per cent of the profit.

### Range extended

CLUSTERED word processing systems have been added to Wordplex's range of display WPs. Called the Wordplex 1.2 and Wordplex 1.3, these systems have two and three typist stations respectively, and one printer shared between the typists.

### Flexel order

LARGE numbers of controllers and indicators from its Flexel range have been ordered from Kent Instruments, a member of the George Kent Group, by Foster Wheeler, the main contractors for an extension to the Lindsey Oil Refinery, near Grimsby.

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## Clash of human and machine expertise

DONALD MICHIE  
REPORTS ON THE  
ADVANCES IN  
COMPUTER CHESS  
EXHIBITION  
AND CONFERENCE

THERE was plenty to interest both chess and computer people at the two-day event, Advances in Computer Chess, held at Edinburgh University. One of the highlights was an exhibition match between Mester, Britain's chess program, and Michael Clarke, director of the conference.

The match, sponsored by The Times, was commented on by US National Master Danny Kopec. Match director was International Master Harry Galambek.

Clarke's playing strength lies in the expert range, one level down from National Master. My own conclusions from the match was that if Mester is over to cause anxious moments for a human chess master (such as David Levy), then it will need extension of its present 5-7 ply lookahead to a solid 9 ply.

But the program, developed by John Birmingham and Peter Kent, is a considerable technical achievement, especially considering that it has been done as a spare time pursuit only.

The program ran on the Atomic Energy Research Establishment's IBM 370/188 at Harwell, and was accessed remotely from Edinburgh over the public telephone system.

A different clash between human and machine expertise took place during the computer chess exhibition, sponsored by Computer Weekly. An exhibit mounted by Tim Niblett, of Edinburgh, provided an interactive terminal connected to Ken Thompson's database for the King-Rook-King-Knight ending.

Niblett had implemented it on the Edinburgh Digital Equipment DECsystem 10 in such a way that an end-game expert could play across the board against a machine-stored optimal strategy.

Until recently it was believed that there is not a great deal to be known about the King-Rook-King-Knight ending and that what there was could already be found in the books. Niblett and others have recently shown that these suppositions are spectacularly wide of the mark.

To drive the point home, such giants as Craig Pritchett, reigning champion of Scotland and Britain's No.1 end-game expert, John Roycroft, were given positions of the King and Rook vs King and

Knight game, and invited to play the Rook side to victory against the database. The latter has some three million positions, with the Knight's side best defensive move entered against each.

Lured by intellectual curiosity rather than by the substantial money prizes offered, the chess masters tried repeatedly to win. But the prizes remained unclaimed.

The next research task, on which several of the conference papers had bearing, is the use of the computer-derived knowledge to rewrite the text-books, so that chess masters of the future stand on the shoulders of today's man-machine skills.

Contributions by Michael Clarke and Don Beal of Queen Mary College, London, emphasised this same theme, the refinement of existing book theory in respect of clarity, accuracy and completeness.

Clarke's paper, and a paper from Max Bremer, of the Open University, showed that even so humble a problem as King and Pawn vs King offers rich material for computer-aided theory building.

On a different note, John Moussouris of Massachusetts Institute of Technology, and Oxford, and Kevin Coplan, with a home-built chess machine, gave glimpses of a highly topical question. How should we blend super-powerful, highly parallel, special peripherals into integrated man-machine problem solvers?

Another overseas contributor, Jacques Pirat, of Paris University, revealed new details of his program for finding deep tactical combinations. Outclassing as it does Grand Master skill at this narrow task, the program is at this very least a coup de theatre.

But it is much more, for this performance has only been achieved (some say could only be achieved) through a structure of goal formation and reasoned planning which closely parallels the tactical thinking of the chess master.

The man-machine which stole the show was Edinburgh Regional Computing Centre's display of its adaptation of the University's EMAS interactive software system for ICL's 2900 new range.

Three chess programs — strong, weak and beginner — were available, on seven terminals connected to the cen-

tre's ICL 2970. Until late at night the public queued for a turn at a terminal as the parallel battles raged.

Will there, I wonder, be chess on videotape? The conference, for which IBM had provided financial support, ended leaving an intriguing question in the air. Should there be a regular world championship for computer assisted chess? Would we then see works teams formed of mixed industrial and academic composition, as in the heroic era of motor racing?

Victory will go, as then, to those who can most creatively match new designs and instrumentation to the human's special skills and thus potentiate them.

Time will tell.

## Barcelona seminar offers major contribution to data encryption

AS the value of computer data grows rapidly every year, the subject of data encryption becomes more vital, but expertise in the subject is spread thinly and information hard to come by.

A concentrated 2½-day seminar in Barcelona from June 18-20 promises to make a major contribution to understanding of the problems and solutions proposed.

Entitled Commercial Cryptographic Technology, it is being organised by Ketrion Inc of Wayne, Pennsylvania.

The seminar will present two basic methods which result in

strong cryptographic systems. It will examine the US National Bureau of Standards' specification for a data encryption standard, discuss the use and administration of cipher keys within an organisation, and address the issues of cryptographic key generation and authentication.

The seminar will be led by David Freeman, of Ketrion, who spoke at the Infotech seminar on IBM and the future, in London last March.

Lecturers will include Dr Carl Meyer, whose work contributed to the NBS standard; Dr Walter Sedelow, Professor of Computer

Science at the University of Kansas; and Larry Buchbom, who has been designing computer-based information systems for 15 years.

The seminar costs \$450 for tuition, plus \$45 for each organisation sending representatives. The same seminar was held in New York City from May 8-10, and will be held in Denver, Colorado from July 24-26.

Further details can be had from Charlotte Woodford, Ketrion Inc, 530 East Swedesford Road, Wayne, Pennsylvania PA 19080; telephone 215-687-6300 preceded by the international dialling code for the US (0101 in the UK).

## UDS-2000 processor

THE processor in the new Univac UDS-2000 key-to-floppy disc system is a powerful 16-bit microcomputer which emulates the minicomputer in the Univac 3780 communications controller. The AMD 2801 4-bit slice microprocessor chip.

Univac at present offers the system with one master and up to three slave terminals, each supporting two floppy-disc

drives. It is programmable in a subset of Cobol, and comes with 32K or 64K words of memory.

The UDS-2000 also supports a stand-alone, floppy drive accessible from all terminals, character and line printers, card reader, interpreting punch, and nine-track tape unit.

The power of the processor suggests that the new system will offer considerable growth potential in the future.

## Transdata deal with Ultronic

LOOKING for a high reliability printer for its new Model 31 time-sharing terminal, terminal manufacturer Transdata has turned to Ultronic Data Systems, a company in the Dowry group. The OEM agreement calls for Ultronic to supply a minimum of 100 Ricoh RP4000 high-speed printers over two years.



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**DATASAB**  
Part of Scandinavian in a worldwide technical organisation

Last Year, Computer Weekly and the Data Processing Management Association organised a workshop on improving DP/user communications (CW, December 8, 1977). At the same time a survey was conducted of DPMA members on this vital topic.

NIGEL LAURIE of Communications Audit, who developed and presented the workshop and designed the DPMA study, reports on the findings of the survey.

Later this year, Computer Weekly, the DPMA and Laurie once again will

be organising a workshop on successful user relations (see coupon).

In this article Laurie explains why, although user relations might seem to be a thorn in the flesh of DP managers, they offer enormous opportunities to the DPM who can communicate well.

# How the DPM communicates

"It's vital, but we just don't have the time or resources," was the view of many DPMs who took part in the survey of DPMA members on improving DP user communications. It reflects the dilemma facing today's DPM: should he run the DP shop or manage the relationships between DP and the rest of the organisation?

The mini-survey of what DP managers are really doing for showed how internal matters eat up the DPM's working day. Yet few would dissent from the claim of one that "the initiative and responsibility to establish and maintain effective communication rests with DP management."

Hard-pressed as they are, DPMs do communicate and through many different channels. Direct personal contact proves most popular (only two DPMs work without it), with system documentation a close second and used by four out of five installations.

The well-tried steering groups are used by just over half the respondents as, more surprisingly, are induction presentations.

Three ad hoc methods follow in popularity: fault reporting systems (used by 47%), seminars/briefings (40%) and a hot line for user problems (37%).

When one looks at the rated effectiveness of techniques, a different picture emerges. Rated most effective is one of the least used: the DP information officer who scored an average of 92% for effectiveness. Direct personal contact scored 88% and joint third place went to the hot line and the developing of users with specialist DP knowledge in their own departments (77%).

Two little-used approaches — assigning DP staff to user departments and the use of joint task forces — scored 75%. Systems documentation scored only 61%. Surveys of user understand-

ing and attitudes, on the other hand, scored highly for effectiveness (75%).

In any fast moving situation, less formal communication tends to play a key role. The survey confirmed this; documenting skills may be needed, but only 7% rate them most important for successful user relations. Over two-thirds stated interpersonal skills (eg interviewing) contributed most.

DPMs were given four user relations problem areas and asked to assign absolute ratings of importance to each. Those offered were:

- Support for existing users (eg advice, education, documentation, etc)
- Management of change
- Employee education — making all staff aware of the basics and potential of DP
- Management education — getting across the need for an integrated DP strategy

All are outside the DP shop and some are not traditional concerns of DPMs. Yet all received high ratings and three emerged as "vital."

If relations and communications matters so much, one would expect the DPM to hold the reins. In most cases he does so, but in nearly one-third of cases no single executive retained control. And only one in five DPMs has an overall communication plan. Not surprisingly, then, few DPMs are able to ensure the success of their user relations on a regular basis.

DPMs were asked to describe the major obstacles to successful user communications. Answers varied widely but fell broadly into three groups: 1 Problems inside the DP department; 2 Problems of communication itself; 3 The attitudes and outlook of users.

The most common internal problem cited was sheer lack of

resources, such as time and people with the right skills. As a result, the communications job (eg writing a user guide) is not done well first time, so user queries return to plague busy DP staff later.

Sometimes the problem lies in communication itself. DP does not communicate in a vacuum. The user audience is exposed to the outside world. It can get its image of computing from sources outside the DPM's control, such as Tomorrow's World. And the industry's "worship of jargon," in the eyes of some respondents, has done little to help.

But it is user attitudes and outlooks which provoke most concern. At worst, DP staff and users live in two different worlds. At best they see the same things from different points of view. "Prejudice," "inertia" and "human nature" may appear to blame; but DPMs offered some deeper explanations too.

According to respondents three key symptoms of poor relations — and obstacles to

## QUOTE

"In a large organisation the problem is ensuring that all levels of user from board to clerical and shop labour are appropriately informed — the variety of approaches is an obstacle to success." — DPM, Worcester.

their development — are: resistance to change (and to "old tricks for new dogs" as one DPM put it), differing priorities or "lack of commitment" and lack of top management support. All make open communication hard to establish — and all make it very necessary.

Asked for their practical advice, the DPMs offered many comments. Some will meet special needs but others will certainly apply to most installations.

● Users welcome a choice of communication channels. They prefer access to formal and informal techniques, one-way and two-way methods and ones they can invoke when they wish as well as those initiated by DP.

● Always provide a formal and informal route for suggestions, questions and complaints and accept all, gratefully, was one DPM's way of putting it.

● Formal channels are needed — but they are rarely enough. They do not encourage helpful but low key user comments. A suggestion or complaint made in passing commits neither side and yet can alert DP to likely future troubles. A formal complaint, sent through the fault reporting system, is a different matter. It may be delayed until the problem reaches a more critical stage. In short, "too rigid channels of communication discourage individual initiative and encourage users to live with their problems."

● Users need to be told why communication is important. If they are not, the lack of feedback may cause problems which affect them later.

● Users need named contacts and easy access. They should

Nigel Laurie reports on the survey findings



have "a known person to whom to turn for advice and help" advised one DPM, and another commented "on open door policy for users."

● The personal standing or image of the DPM counts for a great deal.

At the DP/User Communication workshop staged in London in December, delegates were asked: Which three activities (from a list) have taken most of your time during the past 12 months?

The list included: liaison with suppliers, training and supporting current users and developing and selling a long-term strategy.

A clear "first" was personnel management of DP staff: nearly 70% voted it major time-consuming work. Next came ensuring the reliability and availability of user systems. Third, but with only 28%, was creating a favourable climate for DP throughout the organisation.

Striking is the heavy emphasis on managing DP staff. Many DPMs clearly feel unable to delegate the work and thus free themselves to focus on building user goodwill. (In some installations, however, there is a clear

trend to appointing "internal" managers. They manage the DP department's operations while the DPM manages his department's external affairs).

In a changing field firm conclusions are out of place. The survey does, however, suggest the following:

● DP staff problems may always be with us, but tomorrow's key problems will lie outside the DP shop. When it comes to change, support, employee education and management commitment the DPM's attention will be all important.

● The user manual is the Achilles Heel of many systems — perhaps because writing skills are not rated by DPMs as important.

● User surveys can pay off.

● A "regular and informal presence" in all user departments is vital.

● User communication needs to be managed. It is not a one-shot affair. And since users vary many different approaches will be needed to ensure success.

● Communication barriers may be widespread, but so are opportunities. Most DPMs have yet to exploit many of the powerful techniques now ready to hand.

## About the survey...

THE survey was carried out by Communications Audit in association with the DPMA. Association members received a postal questionnaire and selected respondents were surveyed in more detail by telephone.

The purpose of the survey was to establish some basic facts about DP/User communications.

● Which techniques are used most — and which are rated most effective?

● Which skills are most important?

● Which key areas have top priority?

● Why are user relations sometimes difficult?

● What communication techniques have DPMs found most profitable?

Responses came from 43 installations employing more than 1,700 staff in departments ranging in size from two to 500 staff (average 40). They service more than 1,500 directly interfacing users in organisations ranging in size from 50 to 35,000 staff (average 2,503).

Survey analysis was carried out by Abraham and Partners using facilities provided by ERA Computer Services of Leatherhead. The help and services freely provided by these organisations are gratefully acknowledged, also all the DPMA members who took part.

## CASE 1—power of the user survey

The DPM of a small London installation takes "a business look" at his function. Every few months an analyst visits managers and users to find out what they use. "What is the service like?" and "Are you using all the listings?" are among the questions put.

The practice started when the DPM came to the job and found a hostile climate. He did the first survey himself to show his goodwill and intention to provide service.

Results of the first survey? One system was rewritten to meet user needs more closely. And three more were visibly improved.

Now users offer suggestions to DP, where before they complained to each other.

## CASE 2—involving the user

The new DPM of an old established London company makes his organisation safe for computing by involving users in development right from the start. Past changes had been introduced "top down". His approach starts with a question to users: "This is what we want to do — what do you think of it?" Then the plan is outlined as "our system" and never "the system".

The reasons for the system are given and the benefits to users providing input are made clear. Above all a group feeling is encouraged: when system is explained by DP, for instance, company board members join the staff audience.

The DPM sees himself as the "highlighting conductor" — a face and name at head office which everybody knows. In a firm where salesmen provide input from the field this focal point pays dividends.

Now future DP plans are accepted more readily. For before a system can go live, all staff understand it and why it is needed. Involving users has visibly shifted their attitudes.

## CASE 3—managing the informal communication

A local government DPM takes a two-prong approach to user communication. There is a formal channel — and an informal one.

Spokesmen from each council department sit on a high level working party reporting direct to the chief executive. This meets the need for official channels in the council and gives every user an official say. It does not, however, allow the DPM to keep his ear to the ground. To do so he makes a point of being seen in the staff canteen and letting people talk informally with him. Users who would never approach him officially through their representative are happy to meet casually off limits. Much useful input is gained, often of a kind which does not reach official groups.

## Computer Communications a new bi-monthly journal

THE second issue of Computer Communications is now out, and it contains articles on Euronet, the Post Office and packet switching and other aspects of network operation.

The bi-monthly international journal aims to provide in depth coverage of developments in standards and protocols, the design and construction of computer systems.

Feldman and Don of the Post Office the lessons learned from the experiments. Switched Service experiments from 1969 to the

effect of the advent of X25, and the benefits of the experiment to future public data networks.

John Wong of Waterloo University, Canada, uses a model to analyse the performance of flow control techniques. He shows how degradation of total throughput under certain loading conditions can be avoided.

The journal invites technical articles covering all aspects of the uses of computers and telecommunications technology.

Details from Gareth Jones, ITC Services, Technology Press, 32 High Street, Guildford



## NORTHERN APPOINTMENTS



# How to make the best use of our resources

By Val Halliwell

AFTER spending some time working in Holland last year, what a wonderful feeling it was to drive from Hull to Manchester over the Pennine Range which seemed to welcome me as a long lost friend. After the monotonous flatness of Holland, with all due respect to our Dutch friends, one suddenly becomes aware of what magnificent countryside and scenery the North of England has to offer; the rolling Cheshire plains, the Bronte country of Yorkshire, the Lancashire and Derbyshire Peak District and Dales in addition to the many cultural centres and University towns.

The quality of life in the North of England is second to none, offering first class support to the sporting

world, the Arts and, in general, facilities for a full family life. The area is also exceptionally well served by motorways.

Traditionally, the North of England grew up around the manufacturing industries and, having been quick to computerise, it can therefore offer skilled computer staff the whole spectrum of applications ranging from the pure scientific to sophisticated production and inventory control.

Having been in the computer industry for nearly 10 years, spent mostly on the recruitment side, I have seen it go full circle.

Currently, as the pages of Computer Weekly will testify, there is a well-established shortage of skilled professional personnel

in the marketplace. It is clear that the present shortage of trained DP staff results from the failure of DP departments in the past to invest enough in training. The situation has been further aggravated by the reluctance of many companies to take on those with little or no experience.

However, as the past 12 months have seen a dramatic increase in staff requirements, due mainly to many companies embarking on ambitious development and expansion programmes shelved during the early 70s, problems in recruiting qualified staff have encouraged a number of companies to organise their own training programmes.

One example is the Littlewoods Organisation in

Liverpool, which has set up an excellent training school, off site offering a structured comprehensive training scheme for the whole of management services. While the Tops courses are producing some useful programmers, another source of professional competence still to be recognised comes from the Specialist Groups set up by the British Computer Society for the Physically Disabled.

We tend to think that the accident will only happen to the other fellow, but how easily could we become physically disabled. I feel we should give the disabled more opportunities to prove themselves in the computer industry and that this is an obvious and, until now, untapped source of manpower.

Recruiting additional staff is not an automatic solution. An alternative is internal recruitment. There are many junior staff in organisations who are able and willing to be retrained for computer work. This ties in with the great advantages for a company of developing its own staff. By utilising existing staff, offering them responsible work with real career prospects within the company, it is possible to reduce staff turnover.

The Operations area in particular holds good potential. Given formal training and adhering to set standards, it is possible for the operator to couple his technical expertise with programming techniques available in the installation to aid the implementation of

new software and applications to the system.

Another area in which development is going on is that of management progression. The ability to successfully manage and direct the technicians in DP is becoming more of a science than ever. There have been great strides in this area with data processing managers recognising that a large part of their job is the direction in which they guide the careers of their staff, as well as the delegation of responsibility to their departmental heads, thus creating a clearly defined career path.

Once the computer professional has accumulated worthwhile technical experience, the most sought after requirements at present are in database and

telecommunications.

Having made a self-assessment of his/her abilities, it is often useful to gain confirmation in the form of career guidance before moving to a new job. So often, after a good start to their career, people go off at a tangent to satisfy a whim, thereby jeopardising their future prospects.

The majority of long-established recruitment consultancies offer a career guidance service and by being in constant touch with their clients are well equipped to advise candidates on the training facilities and policies together with future career prospects a particular employer is able to offer, thereby ensuring full utilisation of the skills we have available.



The North of England not only offers a breathtaking countryside comprising the Pennines, the Dales and the rolling Cheeshire plains, but also excellent facilities for sports and general arts far leading a full life. The area is also well served by industry and so offers ample opportunities for skilled computer staff, writes Val Halliwell, managing consultant of Victorio Appointments.

But there is a well-established shortage of skilled professional personnel in the marketplace, comments the author, and goes on to give some valuable advice on how to tackle this problem. Being a member of the BCS Specialist Group for the physically disabled, Miss Halliwell wants the companies to particularly seek out and train the staff among the disabled.

## IBM PROGRAMMERS AND SYSTEMS ANALYSTS MANCHESTER

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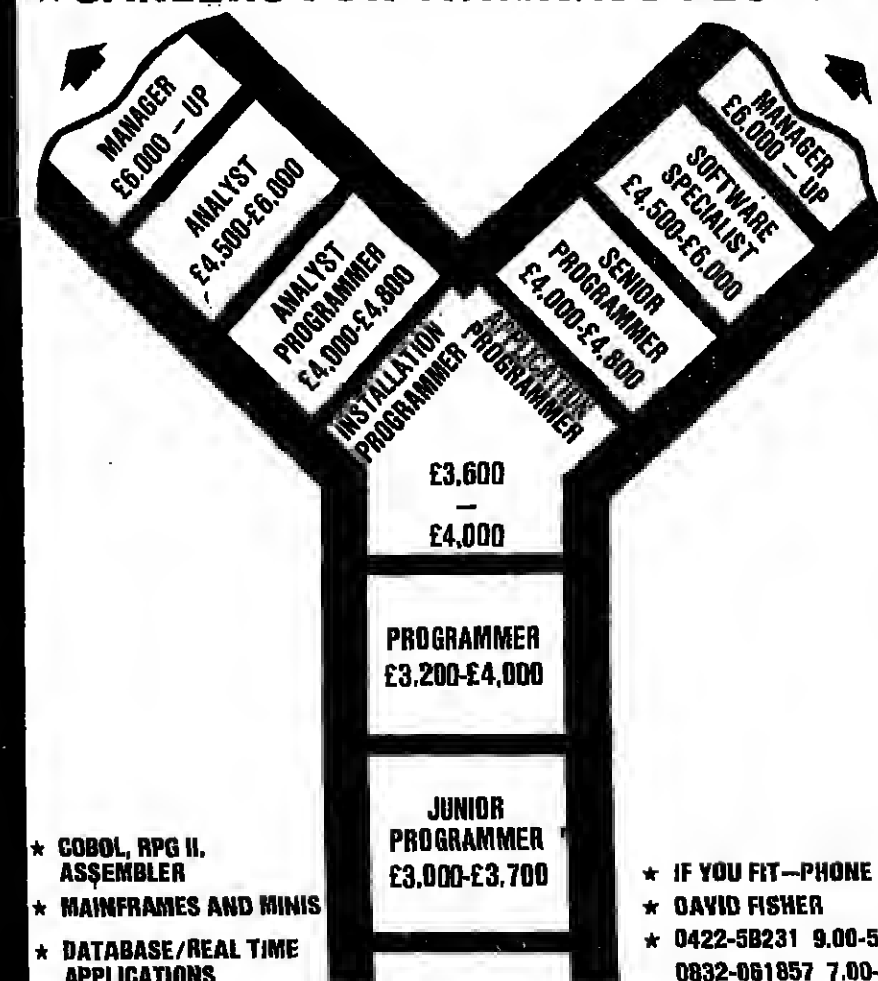
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### WEST YORKSHIRE

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This progressive mail order company now requires a Systems Programmer to join a small team providing technical support to the Computer Services Department using ICL 1904S (Dual ICL 2860) and DEC PDP 11 and IBM 370/138. There will be major responsibility for the development, maintenance and advising on the use of all non-application software, including direct with external suppliers on evaluation of new software products. In addition to resolving problems with existing facilities.

Candidates should have a minimum of 2 years' IBM DOS/VS Systems Programming experience, knowledge of DEC and/or ICL being an added advantage. The Company offers first class terms and conditions of employment with exceptional opportunities at a Senior level for a person with particularly relevant experience and management skills.

Relocation expenses will be paid where appropriate.

Ref. C.1578

### LIVERPOOL

#### Production Control Manager

One of Britain's leading retailers has a vacancy for a Production Control Manager on their central configuration. The job involves the control of a small section of staff who are responsible for the processing of work through Operations, the scheduling of their supply and distribution, and performance measurement of the installation. The Manager of this section will eventually have a full appreciation of the business requirements, and will be responsible for the management of the section.

Applications are invited from both men and women who have at least 5 years' Computer Operations experience, some of which must have been in a supervisory capacity.

Good 'A' Level education is preferred and the suggested age group is 25-35 years of age.

Ref. C.2578

### Trident Management Limited, Leeds

#### 2 Programmers

Two further young and enthusiastic programmers are now required to join this small team currently engaged on general commercial applications, with plans to develop exciting new on-line TV-Sudio applications.

Best experience in some of the following fields would be an advantage:

- COBOL
- ASSEMBLER
- BASIC
- FORTRAN
- ALGOL
- PASCAL
- LISP
- PROLOG
- ADA
- C
- PL/I
- REXX
- SNOBOL
- SIMULA
- SMALLTALK
- TUTOR
- VISUAL BASIC
- VISUAL C++
- VISUAL J++
- VISUAL BASIC .NET
- VISUAL C#
- VISUAL J#
- VISUAL BASIC .NET
- VISUAL C#
- VISUAL J#

The successful candidate will be responsible for the development, maintenance and advising on the use of all non-application software, including direct with external suppliers on evaluation of new software products. In addition to resolving problems with existing facilities.

Applications are invited from both men and women who have at least 5 years' Computer Operations experience, some of which must have been in a supervisory capacity.

Good 'A' Level education is preferred and the suggested age group is 25-35 years of age.

Ref. C.2578

### LEEDS

#### Systems Analysts and Programmers

We are looking for additional Systems Analysts and Programmers to meet the increasing demand for computer development in this Group of Manufacturing Companies.

The development policy within the Group is towards distributed processing with an in-line focus to a central ICL 9011 mainframe.

We are looking for:

1. Systems Analysts with a sound practical approach to the solution of business problems and a 2 years' experience of developing and implementing new computer systems.
2. People with some programming experience who wish to take the opportunity to be trained as Database and/or Systems Analysts.
3. Experienced Database programmers with some design experience.
4. For the mainframe, programmers with a minimum of 2 years' experience of writing PL/I and/or COBOL programs in a tape and disc environment. Experience of design and communications programming will be an advantage.

Ref. C.4578

### PRESTON

#### Program Designer

(NEW APPOINTMENT)

An opportunity now exists for a DP Professional with approximately 4-5 years' DP experience gained in programming and/or Systems Analysts to take up this NEW APPOINTMENT of PROGRAM DESIGNER. The successful candidate will have the Systems and Programming skills who are currently developing on the Design Components Stock System. Candidates with communications background gained in an ICL 9000 environment would be an advantage.

The Company offers excellent prospects for Personal progression and is situated in a brand new purpose built office block. Assistance will be given with relocation where necessary.

Ref. C.5578

### ARMSTRONG

### NORTH HUMBERSIDE

The Armstrong Group of Companies is a major international supplier of industrial control systems to both the process and discrete manufacturing industries and through its own worldwide distribution network. It is also a major supplier of industrial machinery and plant.

The introduction of a new Honeywell 68 has created the following vacancies:

**SYSTEMS PROGRAMMER** who will implement and maintain TOS, COBOL and ALGOL software together with monitoring machine performance. A minimum of 10 years' experience in the field of process and batch control ideally have been gained on Honeywell equipment.

**SYSTEMS ANALYST** who will work with processing systems associated with the distributed factory. Broad based experience of three or four years' on distributed applications from inventory through stock control to order generation. Some form of plant experience will be an additional asset.

**COMPUTER PROGRAMMER** who will be involved in the development of applications for the control of industrial machinery. A minimum of 10 years' experience, the successful candidate will have a good knowledge of process control and batch control.

These posts are based in North Humberside where there is a large and established industrial base. Relocation assistance offered where appropriate. Future development opportunities are excellent. The successful candidate will be given a first class track record and offer a competitive salary.

Ref. C.6578

## ANALYST/PROGRAMMERS

### THE CLIENT

Our Client is a new division of a multi-million pound organisation operating in the North-West, but with substantial overseas and UK operations.

They are engaged in the marketing of mini computers as a Turnkey operation and in the provision of software services to a variety of clients and their own Parent Group.

With a five year company development plan they require ambitious people who will be capable of performing a Consultancy role in the near future. There are positions available in the North West and London.

For further information and a local interview, contact your nearest regional office.

021 643 4433

### THE APPLICANTS

The ideal applicants will have approximately two years' commercial applications experience on mini computers and preferably a Computer Manufacturer/software house background.

The ability to communicate is essential and the preferred languages are COBOL, RPGII, COBOL, or ASSEMBLER.

Whilst commercial experience is preferred, consideration will be given to Technical applications people with good mini experience.

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### SYSTEMS ANALYST £5,500

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6. Sales	Package sales	Manchester	c. £8000+
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10. Programmer	Min. 1 yr Cobol	Manchester	to £4500
11. Systems Programmer	Cobol or Plan	N. Manchester	to £5500
12. Analysts	Commercial exp. and programming	Surry	to £7000
13. Analyst/Programmer	Cobol	Witral	£ good
14. Programmers	1900 Cobol or RPG II	S. Manchester	to £5500
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19. Sales	Software house	Liverpool	£7000 Basic + car + bonus
20. Analyst/Programmer	Basic + min exp.	London	to £6500
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23. Programmers	Min exp. experience	Various	to £5500
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6. Software House	IBM and ICL Cobol and Assembler	West Yorks.	to £5000+ bonus
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9. Senior Programmer/Analyst	IBM 370 Cobol	Wakefield	to £5500
10. Programmer/Senior Programmer	ICL Cobol	Hull	to £5000
11. Programmers	IBM Cobol or Assembler	Sheffield	to £5000+ bonus
12. Programmer/Senior Programmer	Univac, Cobol	Sheffield	to £6000
13. Programmers	ICL 2904, Coral	Lincoln	to £5000
14. Programmer/Chief Programmer	PL/I	Hull	to £6000
15. Analyst/Programmer	Commercial systems	Leeds	to £5500
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17. Analysts	Commercial systems, Minis	Leeds	to £6000
18. Senior Analysts	Solid commercial background	Hull	to £6000+
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20. Senior Systems Designer	IBM, Commercial systems	Leeds	to £6200
21. Analysts	Management systems	Sheffield	to £6000
22. Project Leaders	Commercial & Financial	Sheffield	to £6500
23. D.P.M.	ICL 2903 Site	W. Yorks	now + review in July to £6000 (review soon) to £14000+ car
24. Sales	Bureau and Minis	Leeds	to £14000+ car

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# WEST YORKS

## PROGRAMMERS

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\* Our client who has one of the largest and fastest growing IBM purpose-built computer centres in West Yorkshire, would like to recruit Programmers to complement their expansion programme for 1978.

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## Engineers/Programmers Hardware & Software Design

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## Systems Analysts

London/possible overseas travel starting up to £7,500  
A major systems development project, involving a large database and teleprocessing network, is commencing with a leading international company. The team is being formed and vacancies still exist for Analysts with a broad commercial applications or systems background on any type of machine. It is highly probable that, as the staffing level expands into the project, original team members will progress into senior positions with correspondingly high salaries and responsibility (maybe in Europe). This is perhaps one of the most exciting projects being started in the U.K. Exceptional opportunity to get involved, maybe for the first time, in large database development work. Contact: Mike Creamer

## Sales Support Analysts

West of London circa £6,500 + car  
If communications and terminals are your interest or speciality, coupled with the ability to deal with customers, then this client of ours would like to meet you. Being a recently acquired subsidiary of a major world organisation, the company now has the increased resources to speed up their penetration of the network and d.c. processing marketplace. Candidates will ideally have a background of programming or analysis, the personality and presentation to confidently meet new clients, plus the vital overall knowledge of the d.p. industry. Do not miss being considered for this great opportunity. Good up-market salaries and definitive career prospects. Contact: Mike Creamer

For further information on any of the above vacancies please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

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## Consultant Analysts & Programmers

Surrey up to £7,000  
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## Business Systems Consultants

South London based up to £7,000  
Our client, one of the major computer manufacturers in the U.K., has opportunities for Business Systems Consultants to join the Customer Support group based in South London. Applicants should have five years' experience in data processing with the majority of that spent in the design and implementation of commercial applications. For the more senior positions candidates must have undertaken feasibility studies and been involved in defining user department requirements. The Company is looking for staff with maturity, sound business background, diplomacy and the ability to meet objectives with minimal supervision. Excellent salaries and career development. Retraining available. Contact: Jim Baker

## Programmers

London up to £5,600  
We have been retained by a large organisation to recruit several Applications Programmers to join the expanding development teams. The installation, which is based on ICL 2980's uses both communications and database techniques. Candidates should have a sound commercial programming background, preferably using COBOL on ICL hardware, and a willingness to be retrained on the 2900. The more junior positions require at least two years' experience and probably four or five for the senior vacancies. Knowledge of teleprocessing, real-time systems or database would be an advantage. This is an excellent opportunity to work with professionals in a sophisticated and original environment. Salaries are negotiable according to experience. Non-contributory pension scheme. Contact: Jim Baker

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Age \_\_\_\_\_ Place of Birth \_\_\_\_\_ Car? \_\_\_\_\_

Are you prepared to relocate? \_\_\_\_\_ UK/Abroad (delete)

**Experience** Place no. of yrs. in box, e.g. IBM 360/370... [4]

**Machines:** Please specify model. **Applications**

IBM 360/370... [ ] Commercial... [ ]

IBM others (specify) ... [ ] Financial... [ ]

ICL 1900/2900... [ ] Payroll... [ ]

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Honeywell... [ ] Stock control... [ ]

Univac... [ ] Scientific... [ ]

Burroughs... [ ] Realtime... [ ]

PDP... [ ] Software... [ ]

Other mainframes (specify) ... [ ] Database... [ ]

Other mini-computers... [ ] Message switching... [ ]

(specify) ... [ ] Communications... [ ]

Other mini-computers... [ ] Data transmission... [ ]

(specify) ... [ ] Central process... [ ]

Other mini-computers... [ ] Teleprocessing... [ ]

(specify) ... [ ] MIS \*CPA\*/PERT\* [ ]

Other mini-computers... [ ] Magnetic tape [ ]

(specify) ... [ ] Disk... [ ]

Other mini-computers... [ ] Others (specify) [ ]

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## Is this what's stopping you going in for contract work?



At Knight's we can offer you a little encouragement. As one of the largest DP contract staff organisations in Europe, we'll have no trouble finding you your first contract. And for much the same reason we'll be able to find you your second, and third, and so on. But the most important thing is our reputation for

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Knight Computer Services Limited,  
14 Old Park Lane, London W1Y 4NL  
Staff Services Division of BOC Datasolve Group and  
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01-491 4706

# Honeywell have created a powerful, new General Systems Division... now we're after a powerful, new, Systems Manager

Honeywell, one of the most successful computer companies in the world has, as part of its internal restructuring process, created an important new area of operation to handle the marketing of Level 62 and 64 Systems. This is the General Systems Division.

We are now looking for a Divisional Systems Manager to join the management team. The successful man or woman will undoubtedly come from the forefront of the computer industry. A broad background of at least 10 years in the industry will be expected. As Systems Manager of this new Division, which has a substantial existing customer base, you will report directly to the Divisional Director.

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Honeywell

01-491 4706

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**Programmers**  
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**Programmers/Analysts**  
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**£6,000-£7,000**

SaFeS (Small Factory System) is the most successful production control package currently available in the UK. It is marketed worldwide by ICL and has achieved over 50 sales to date.

SaFe Computing is one of the fastest growing software houses in the UK with offices in Leicester, Birmingham, West Bromwich and London.

Currently, all work on the SaFeS package is carried out by Manufacturing Systems Division based in Leicester.

In response to the considerable demand for the package, SaFe Computing has recently opened an office in the Reading area. This office will initially be involved in servicing SaFeS customers in the South of England.

Experienced systems and programming staff are required to install and develop the package. These staff will be based in Leicester or Reading but may be required to travel throughout the UK, Europe, North America and other overseas countries.

Opportunities with SaFe Computing are for staff who are interested in applying their experience to achieve the effective use of small computers in a practical business environment.

A SUPER-SaFeS package is to be developed on SaFe's new 2960 shortly to be installed at West Bromwich.

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To apply for these positions, please contact:

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## PRODUCT SALES MANAGER WORD PROCESSING

London

Quota Earnings £16,000 + Car  
(Base Salary up to £10,000)

OUR CLIENT is a subsidiary of a profitable U.S. based supplier of Data Entry and Word Processing equipment. All European and International business is controlled from West London and the Company is enjoying a period of major growth having already established a large and impressive list of users.

THIS IMPORTANT APPOINTMENT, which reports to the Marketing Manager, Europe entails responsibility for the marketing and development of the current stand alone and shared logic word processing systems.

APPLICANTS should have a substantial and demonstrable track record in the sale of word processing systems, a high level of system competence and the ability to grow within a dynamic organisation. It is equally important that the person appointed is able to effectively contribute to the success of major negotiations.

To discuss this EXCITING OPPORTUNITY, applicants should write in complete confidence enclosing full career details quoting ref: CW082 or telephone David May, Advising Consultant on 01-486 8991.

**Peteron davidson ltd**  
102 Blandford Street, London W1H 3HH Telephone 01-486 8991



### SYSTEMS ANALYSTS

LIVE IN THE  
COTSWOLDS OR THE  
VALE OF THE WHITE  
HORSE

Our client, who is situated in this beautiful part of the country, is expanding its Management Services Department and is looking for forward thinking young Analysts who are prepared to accept a challenge, work as part of a Business Analysts team and take project leader responsibility in the near future.

### THE REQUIREMENTS:-

- Educated to at least 'A' Level standard.
- Outgoing personality - plenty of user contact.
- Self-motivated and able to accept responsibility and work on own initiative.
- A good commercial background and an appreciation and understanding of a business environment is essential.

### THE REWARDS:-

- Salaries to over £5.5K plus relocation and regular salary reviews.
- Working with the latest and most sophisticated computer hardware undertaking a variety of projects.
- Good career progression and training with an expanding go-ahead Company.

For more information contact:  
Peteron Davidson Ltd  
102 Blandford Street, London W1H 3HH  
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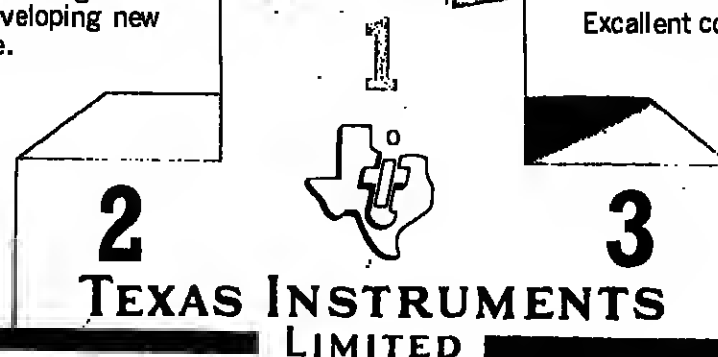
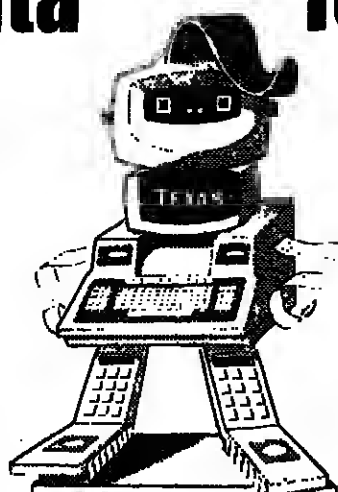
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## Selling Texas Mini-Computers and Data Terminals

This is your chance to join one of the trendsetters of the mini-computer market. Our products are in the forefront of computer technology and are taking the commercial, industrial and OEM markets by storm. We are a really international organisation and are backed by the security and research capability of a billion dollar corporation. Our market penetration is growing rapidly providing career prospects for ambitious, self-motivated individuals that you'd find hard to beat. We are looking for

### Mini-Computer Sales Engineers

**BASED SLOUGH AND BEDFORD** base salary £6500 on quota earnings c£10,000 + 2 litre car + profit sharing to sell computer systems in the £5000-£250,000 range. You will be managing existing accounts and developing new business in this rapidly changing market place. Our range includes many state of the art products for a wide variety of applications. Excellent technical support is available. You must have related sales, marketing or applications experience - the ideal would be a professional salesman with a proven track record in mini-computer sales. Ref. No. FY/307/1.



### Data Terminal Sales Engineers

**BASED SLOUGH AND BEDFORD** base salary £6500 on quota earnings c£9000 + 2 litre car + profit sharing to manage existing accounts and develop new business opportunities for our family of intelligent and non-intelligent devices, incorporating the most recent advances in innovative technology. A record of success in sales, marketing or applications in this fast growing sector of the market is essential. Ref. No. FY/307/2.

Candidates for these positions, men or women, ideally aged 25 to 40, should be educated to HNC or degree level. Ideally, you should live within a 50 mile radius of Slough or Bedford.

Excellent conditions of employment include profit sharing, free private hospital plan and generous assistance with re-location expenses, where appropriate. Please write or telephone for an application form to Ann Stevens, Personnel Department, Texas Instruments Limited, Manton Lane, Bedford. Tel: Bedford 67466. Ext. 3442.

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UNIVERSITY OF STRATHCLYDE  
COMPUTER CENTRE

OPERATIONS STAFF FOR  
HONEYWELL 6060

**CHIEF COMPUTER OPERATOR  
SHIFT LEADER  
SENIOR COMPUTER OPERATOR**

Applications are invited from Operations staff at various levels to work on the new Honeywell 6060, soon to be commissioned in the University on a day shift/back shift rota. The Universities of Strathclyde, Edinburgh and Glasgow are linked by 50Kb communications lines with Node Processors in each site. Computer systems available through the Network include local systems: PCL 1804S, C.T.I. Front End Processor, Honeywell 6080, I.C.T. 2850 and 2875 systems in Edinburgh and Glasgow, and I.B.M. systems at Newcastle.

Salary Scale (including all supplements)  
**CHIEF COMPUTER OPERATOR:** £4095-£4612 per annum (several years' experience as shift leader required).

**SHIFT LEADER:** £3434-£4227 per annum (at least three years' experience in computer operations required).

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For all positions, knowledge of Honeywell systems operating under C.C.O.S. will be an advantage.

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UNIVERSITY OF LEICESTER

**COMPUTER LABORATORY  
SYSTEMS PROGRAMMER**

Applications are invited for the post of Programmer within the Systems Programming Section of the Computer Laboratory. The work will include:

Implementation of the Midlands Universities Network (MIDNET)  
Development of on-campus, inter-computer links  
The Laboratory has a CDC Cyber 72 operating under NOS AND POP 11 mini-computers providing front end and network facilities.

Applicants should possess a good degree, or equivalent knowledge of data communications or peripheral interfacing would be an advantage.

Salary will be within the range £3158-£3292 p.a. on the Computer Officer Scale, according to qualifications and experience. Further particulars and forms of application may be obtained from the Director, Computer Laboratory, The University, Leicester LE1 7RH.

**EDITOR**

required for an international monthly subscription magazine for Data Processing Management and Senior Computer Personnel. An in-depth knowledge of the computer industry and previous all-round journalistic experience, including editing, are essential requirements. Previous working in the computer industry, or with a computer user, would be desirable. Must be able to communicate effectively with industry people at all levels, control a small editorial department, and work closely with the publisher and advertisement manager.

Apply to: Peter Thomas, Publisher, IPC Electrical-Electronics Press Ltd., 75/80 Blackfriars Road, London SE1 8LU. Tel. 01-261 5111.

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Tylin, the computing services subsidiary of Telford & Lytle, is seeking an Operations Manager to control the Computer room and ancillary operations at their Croydon Data Centre. We offer excellent working conditions and an opportunity to join an expanding company and participate in its programme of commercial growth and industrial development.

### REQUIREMENTS:

- ★ Age 28-38 years
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- ★ 3 years' management experience
- ★ Ability to train and develop staff
- ★ Sound technical knowledge of IBM 370 series operating under TMS/VS and GRASP or POWER.

Preference will be given to applicants with experience of telephone sales.

Application forms and further particulars are available from Mrs. F. J. Phillips.



**TYLIN MANAGEMENT  
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Our client requires sophisticated Systems Analysts or Sales Consultants, with relevant experience, to market their newly developed Computer Terminal Systems to major Financial Houses. Those selected must be able to demonstrate a proven ability to meet with Senior Executives and will preferably have a background in Banking or a similar field. The positions carry a high degree of responsibility as those appointed will be required to market the total concept. The candidates will be aged 28 to 45 and have a degree qualification in a related subject. The Company, an acknowledged leader in computer technology, offers an extremely attractive remuneration package together with excellent opportunities and incentives for permanent career advancement. If you are interested please contact Peter Findlay on 01-584-8606 or 01-584-8478 or write Thurloe Executive, 30, Thurloe Place, London, SW7 2ND, quoting ref. A0189 (AGY).

**Thurloe Executive**

30, Thurloe Place, London, SW7 2ND



## Business Systems Analyst

C. E. Heath & Co. (Agencies) Ltd.

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The person appointed will report to the Management Services Manager of the Agencies Company and the position will be located in the administrative offices of the Company at Southend-on-Sea.

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## SYSTEMS PROGRAMMER

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If you would like to join our growing systems team and use your skills to interface GENESYS with new operating systems on both mini and mainframe machines, telephone or write now.

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We need someone with 2-3 years' FORTRAN experience to develop CAD and graphics application programs. You should have completed at least one major programming project. A degree in engineering would be an advantage but is not essential.

For either post we offer you:

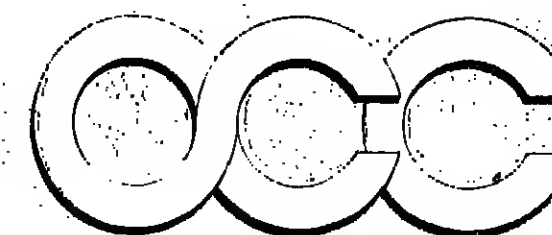
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# Systems Analysts Tehran

**c £14,000 (tax free)**

- + accommodation
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- + medical insurance, etc.

## Manufacturing and Accounting Applications

Our client, a major multi-million dollar US services corporation with worldwide activities in electrical contracting, heavy engineering, aviation support, etc., has recently been awarded a large DP development project in TEHRAN. Applications are in the logistics management area covering Financial, Materials and Maintenance management systems associated with the servicing of aircraft. The installation consists of dual Honeywell 6060s utilising GCOS, IDS and TDS, with some MDQS and TSOS. Programming is mainly in COBOL and on-line program development, data input and database enquiry are in operation.

At this stage, we wish to recruit a considerable number of Systems Analysts to commence employment during June and July 1978. Candidates for these appointments should have a minimum of 3-4 years' systems analysis/design experience, preferably including some involvement with database applications, in a commercial or manufacturing environment. They must be capable of interfacing with user organisations to determine systems requirements as well as designing and writing systems and program specifications. Applications experience should be in one or more of the following areas:

### Financial Management

- General Ledger
- Cost Accounting
- Accounts Payable
- Accounts Receivable

### Materials Management

- Work-In-Progress
- Stock Status reporting
- Inventory Control
- Shipment Control

### Maintenance Management

- Demand Analysis
- Quality assurance
- Workload Planning
- Maintenance scheduling

Positions will be offered on a 1 year re-negotiable contract basis and the company offers an extremely attractive package which includes an excellent tax free salary, free accommodation and of contract bonus, together with the many other fringe benefits associated with a large US corporation.

**The client will be conducting interviews in the UK in early June. These interviews normally take place in London but local and evening interviews can be arranged if necessary.**

**If you are interested in these positions or wish to discuss them further, please call Roger Allington on 01-242 9356 (day) or Berkhamstead (04427) 2299 (evenings/weekends) as soon as possible. Ref. 3901CW/RA.**



## MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

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1st year c £5,000 + CAR

If you have a background in Analysis or Programming and would now like to use your data processing experience to commence a career in the front line of industry our client offers an excellent opportunity to do so. The Company, a leading service bureau, offers a wide range of services to all sectors of industry. The person appointed will initially undergo a period of formal theoretical training followed by in-the-field practical experience. Candidates should have a good understanding of data processing most likely gained in programming or analysis roles. They should enjoy dealing with people and any experience of client oriented situations would be a distinct advantage. The Company offers excellent conditions of employment and first class career prospects to the successful applicant who can expect an initial salary of c £5,000 in the first year rising to an estimated salary of £8,000 in the second year of operation. A company car is provided.

Ref. N1/2808

24-hr. answering service  
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# SYSTEMS ANALYSTS

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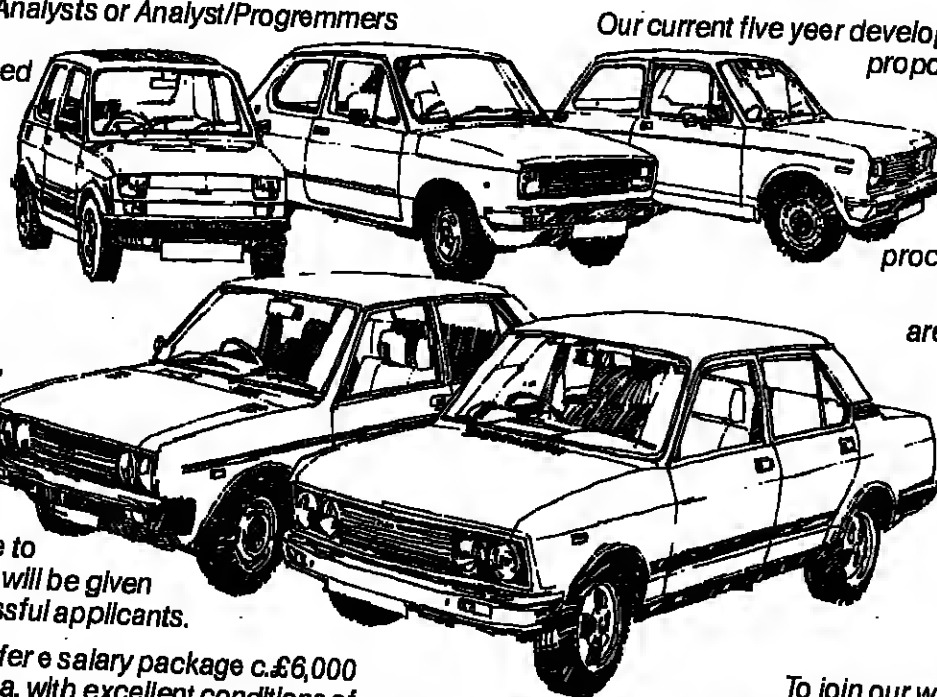
Middlesex... c.£6,000

We are seeking experienced Analysts or Analyst/Programmers keen to enhance their career by developing several advanced on-line and real-time applications using the latest DEC and IBM hardware.

Applicants should have a minimum of three years' commercial systems experience, gained in an installation with high standards of analysis, design and documentation. Knowledge of commercial applications is of prime importance. Technical training in the systems

software to be used will be given to successful applicants.

We offer a salary package c.£6,000 p.a. with excellent conditions of employment at our Brentford computer centre, including a subsidised canteen, pension scheme, generous car purchase facilities and flexitime.



Our current five year development plan includes far-sighted proposals to permit both the efficient distribution of our popular, award winning cars throughout the U.K. and also support our network of dealers with plentiful spares and immediate processing of orders and enquiries.

To satisfy this requirement we are installing PDP 11 equipment in our central warehouse and Brentford computer centre. These will be linked to our IBM 370/138 carrying out on-line and real-time functions. These systems will be supporting first-class products with an automated sales and support system second to none.

To join our winning team, please telephone or write to our consultants:-

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30 Fleet Street,  
London, EC4Y 1AA.  
Tel: 01-353 0981 (24 hours)



## Malmesbury, Wiltshire

### Career Opportunities with Pye TMC Limited

#### Microprocessors Software Computer Aided Design

(Up to £7,000)

The Company's Advanced Development Division is a forward looking design group, exploiting L.S.I. technology in the application of stored programmed control to telephone switching and also the development of other advanced products for the telecommunications industry in both the Switching and Sub-Apparatus areas. The Division is situated at the Company's modern new headquarters in Malmesbury, Wiltshire.

#### SENIOR SOFTWARE ENGINEERS

Required to work in close collaboration with L.S.I. circuit design engineers to produce new microprocessor based products. Applications are invited from Analysts/Programmers, preferably with Intel 8080/85 and mini-computer experience, employed in the electronics industry. A degree in a relevant discipline is preferred. Evidence of the completion of real-time systems properly documented, using Corat or Assembler language together with at least 5 years experience in this field is more important. (Ref. ADU/W/T)

#### SCIENTIFIC PROGRAMMERS

Required to work on the development of software tools for CAD design, automatic test equipment and advanced graphics systems, applicable to the realisation of L.S.I. circuit design. Successful applicants will be working on computer types 801, 802

and DEC 2050. Vacancies exist at both Intermediate and Senior levels. Applications are invited from self motivated and creative people with experience of both Electronics design and Fortran programming. The successful applicant will have a degree in Electronics or Computer Science (Ref. ADD/R/S).

These positions are open to suitably qualified men and women. The Company which is part of the multi-national Philips Group, offers the full range of benefits including subsidised canteen facilities, and discounts on group consumer products, etc. Generous relocation expenses will be paid where appropriate.

For further information, please contact the Personnel Department on Malmesbury 2121 or write with full details of education and career to date (including the appropriate references) to the Recruitment Officer, Pye TMC Limited, Swindon Road, Malmesbury, Wiltshire, SN16 5AA.



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South Berks  
up to £6500

ICL is one of the world's leading companies in the development, manufacture and marketing of computer systems and is expanding both in the U.K. and overseas markets. To keep pace with this expansion we need self starting highly motivated men and women who wish to broaden their career horizons.

In the communications area we are looking for people with a high level of communication systems expertise, and proven ability to produce results under pressure.

For more detailed information please contact Ted Shorrocks on Blackhill (0344) 24842 extension 2046, or write

to ICL at 1, Covehithe Road, Blackhill, Bockley, Essex. Please quote reference C.W.H.R.L.

#### International Computers



### BIRMINGHAM

#### PROGRAMMER/ANALYST

SALARY TO £6300

Small team, big opportunity, large IBM 370. On-line development imminent. B.A.L. programming experience an advantage. Training as required. 5 weeks' holiday. Pleasant surroundings and extensive sports facilities.

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RLCMP (Library Services) Ltd.  
University of Birmingham  
Birmingham B15 2TT  
021-472 1301, Extn. 2441

### DART

are seeking a

#### SENIOR COMPUTER OPERATOR

In their Systems Section at Southampton to operate 1801T under George II and Communications Manager. Applicants must have a minimum of 2 years' experience of ICL 1800 equipment.

Hours 0800 to 1800 and 1400 to 2200, alternating weekly with requirement for alternate Saturday morning working 4 weeks' annual leave plus L.V.s. Salary negotiable depending on past experience.

Applications with full details of employment to date to

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## MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

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#### £5-9K negotiable

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#### THE JOB

As a member of a closely integrated and sociable team of professionals, you will be called upon to use all your skills — programming, systems design and analysis, management and general consultancy, as well as learning new specific skills with the assistance of your colleagues. The main job satisfaction is gained from getting work ready within an agreed cost and time scale. There is a considerable amount of customer involvement and everyone is expected to participate in the sales effort of the company. People are given all the responsibility they can handle and there are unrivalled opportunities for promotion.

#### THE REQUIREMENTS

The minimum requirements for this job are two years' programming preferably in COBOL and/or BASIC, the analysis and design of at least one system, sound commercial systems background as well as the ability to mix with customers and sales staff and manage both projects and people. It is important that staff are mobile although most travel will be local. Otherwise there are no restrictions — the most important requirement is a good business attitude.

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The rewards are excellent: salaries up to £9000 plus valuable fringe benefits, a good working environment, a variety of interesting work and every opportunity for advancement.

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MANAGEMENT & EXECUTIVE SELECTION

## MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

## OPPORTUNITIES IN SOUTH MIDDLESEX

Our clients, a well-established engineering company, are planning to develop a number of new systems over the next four years. The proposed development will mainly be in Production Control systems but also includes some commercial and financial systems. This considerable expansion programme will necessitate upgrading their existing ICL 2900 installation to cater for both on-line and batch applications. It also means the company needs to recruit experienced analysts and programmers so if you are looking for good prospects, an attractive salary and can fulfil the basic requirements outlined below, contact Tony McCreth.

#### SYSTEMS ANAL.

to £7k

#### SNR. PROGS./PROGS.

to £6k

- Good experience of Prod. Control Systems in an engineering environment.
- or — good business experience in industry.
- Mature personality and good communicator.
- Programming background not necessary.
- ICL background preferred.

- Good COBOL experience, preferably with an ICL installation.
- Must be flexible, adaptable and willing to work in a small team.
- Probable age range early to late 20's.
- Must be prepared to handle all programming requirements including involvement with software and utilities.

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MANAGEMENT & EXECUTIVE SELECTION



SPECIALISTS IN DP AND EXECUTIVE RECRUITMENT

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(new development)

CIRCA £6,500 per annum, +  
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Our clients offer this outstanding opportunity to a suitably  
qualified person to join their D.P. Division and to contribute  
their skills developing new Systems for locations in the U.K.  
and overseas.

If you possess experience in some or all of the following areas,  
then this could be for you:

- 1) A Programming background in Cobol/Assembler
- 2) Up to three years' Systems experience, preferably  
gained from working in a Financial environment
- 3) Experience in using CICS/VS and DL1 would prove  
advantageous
- 4) Must possess good communicating ability and be able to  
work well with user management

TELEPHONE OR WRITE TO US NOW TO ARRANGE FOR  
IMMEDIATE INTERVIEW IN LONDON OR THE SOUTH

FACULTY OF SOCIAL STUDIES

PROGRAMMER III

The Data Processing Unit in the Faculty  
of Social Studies requires a Program-  
mer III to join a team of four pro-  
grammers. The Unit has an ICL 4.72 computer.  
The work is mainly of a financial nature  
in the creation and analysis of data  
banks and preference will be given to  
applicant with experience of program-  
ming at a high level language and the  
use of statistical packages. Applicants  
must have a university degree in a  
relevant subject but previous com-  
puting experience is not necessary as  
training will be given.

Salary according to qualifications and  
experience will be within the range  
£3066-£3504 p.a.

Applications, stating the names of two  
referees, should be sent to Miss Queen  
Watson, Administrative Assistant,  
Appointments, University of Exeter,  
EXETER EX4 4JL by 8 June 1978.  
Please quote reference No. 8481.

MEDICAL COMPUTING & STATISTICS  
UNIT

COMPUTING

OFFICER/PROGRAMMER

Required for the Medical Computing and  
Statistics Unit for a medical research project.  
The role is mainly of a financial nature  
in the creation and analysis of data  
banks and preference will be given to  
applicant with experience of program-  
ming at a high level language and the  
use of statistical packages. Applicants  
must have a university degree in a  
relevant subject but previous com-  
puting experience is not necessary as  
training will be given.

Medical Computing & Statistics Unit  
Edinburgh University, Edinburgh.  
Please quote reference 202.

SITUATION WANTED

Male, Nationality German. Seeks  
new surroundings in Great  
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Age 32 years. University Degree.  
11 years' experience in EDP, EDP  
Organisation (Software). Present  
position EDP Manager.

Klaus Mathias Mueller  
12 Kierforn Weg  
5908 Nienstedt/Dorf  
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As one of Europe's leading computer service companies  
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We offer excellent salaries, benefits and working conditions  
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Please write or phone for an application form to:

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Bedford Park,  
Croydon, CRO 2AP  
Tel: 01-686 8251

## MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

PROGRAMMER

BASILDON

c £5,000

An excellent opportunity exists to join the well established data processing department of our client in Basildon.  
The company forms part of a large, well known, international group and as such they are able to offer:

- IBM 370/158
- Full Training
- Manufacturing Systems
- Financial Systems
- Career Prospects
- Analysis Involvement
- Relocation

If your background includes around two years' COBOL programming experience and you would like to know  
more about the position ring now quoting reference E1/2505.

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Please telephone for a confidential  
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- IBM Series 1
- Extensive real time and  
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- Database development
- COM
- Computer typesetting

- Excellent career prospects
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- Subsidised restaurant
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Interested in working for one of LONDON'S largest computer departments?

Why not ring our Chief Programmer on 01-637 9144 or write to  
Staff Appointments and Development Officer  
55 Broadway, SW1H 0BD  
quoting reference 907C1

**LONDON TRANSPORT**

## COBOL PROGRAMMER

Revel, one of the leading companies in fashion footwear,  
are looking for a Cobol Programmer in their Computer  
Department, operating an ICL 2803 system.

The successful applicant will be competent in Cobol  
Programming. Experience of ICL software would be a  
distinct advantage. Opportunity will be given to widen your  
data processing knowledge working in an environment of  
high fashion at our headquarters close to both Oxford  
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The salary will be commensurate with the responsibility  
that the job carries. We offer fringe benefits which include a  
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Please phone Rosemary Johnson on 01-463 0861 or write  
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Contract employment in Europe  
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Our client wishes to employ the following staff on a  
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Our client will pay 35'D Marks per hour (around  
£8) and travelling to and from contract. Assistance  
with finding accommodation will be given.

Knowledge of a European language, though not a  
requirement, would obviously be an advantage.  
Please write to Terence P. Crouch, quoting  
reference 982, or telephone him on 0534 74665

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S. West England —  
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## ANALYST PROGRAMMER

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We're looking for a Philip Morris man (or woman) who just happens to  
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This is a real opportunity created by our recent growth.  
Planned developments in our data processing department have created  
an opportunity for an ambitious Analyst/Programmer to take full responsibility  
for the development of a range of commercial applications.

Our installation consists of two IBM System/32s to be upgraded to a  
System/34 in June 1979. Upon completion of the batch applications towards  
the end of next year work will be concentrated on development of remote data  
capture and enquiry systems. The successful applicant will have a sound  
experience of RPG II and IBM hardware. An understanding of Cobol would be  
an advantage.

This company offers an excellent career path for the enterprising  
applicant including excellent pension, free cigarettes, staggered hours, and  
a salary that matches our optimism and rapid growth.

If you are under 30 and have the above experience phone at once  
to discuss this golden opportunity. Or write (with full details) to:

Jose Marie Pitt, Philip Morris Ltd., Great West House, Great West Road, Brentford, Middx. 01-568 4191



## ANALYSTS &amp; PROGRAMMERS

# The Rolls-Royce Reputation

The Rolls-Royce reputation is an amalgam of technical innovation, design and manufacturing excellence plus adherence to high standards in every sphere of operation.

To be part of it means the opportunity to work in a sophisticated environment backed by technical resources and personal development programmes which are respected world-wide. This statement is no less true in the business and technical systems functions where in order to mount highly complex design and manufacturing programmes to power the aircraft of tomorrow an increasing emphasis is placed on computer based control and information systems covering production, engineering, product support and financial areas.

As part of our development plans we now offer Programmers and Analysts of various specialisations and levels of experience the opportunity to join our business and technical systems teams working at most Aero Division locations, which include Bristol, Derby, Coventry, Watford and Glasgow. You will be working with IBM system 370, Cyber 74 and DEC 10 computers. Control Software used includes MVS, SVS, TSO, IMS, DOS, CICS. A generous relocation package is available and housing is considered reasonably priced in most areas mentioned.

If you're concerned with your reputation, here is a check list. Fill it in and return it to us Freepost - we'll be in touch.

## Add it to yours



مركزنا من الأجل

Just tick your amount of experience in the job categories listed. Indicate the mainframes and systems you have worked under and your preferred locations.

YEARS EXPERIENCE		TYPES OF COMPANY EXPERIENCE		CURRENT JOB TITLE	
1-3	4-6	COMPUTER MANUFACTURER	SOFTWARE HOUSE	MAINFRAMES & SYSTEMS USED	
7-9	10-12	COMPUTER BUREAU	CONSULTANCY	PROGRAMMING LANGUAGES USED	
13-15	16-18	GENERAL USER			
LOCATIONS PREFERRED:		NAME (Mr/Ms)		TEL. NO. DAY	
DERBY	BRISTOL	WATFORD	GLASGOW	EVENING	

Please return, now, by FREEPOST - you don't need a stamp - to: John Buckingham, Personnel Department, Rolls-Royce Limited, Aero Division, FREEPOST: 65 Buckingham Gate, London SW1E 6AT.

ROLLS-ROYCE AERO DIVISION

## ANALYSIS USING ADVANCED TECHNIQUES

LONDON W1

As you know, database, real-time and communications experience is valuable, but most employers are looking for people who already have this knowledge. However, our clients offer the chance of learning these advanced techniques, and do not expect you necessarily to be already familiar with them (although this would of course be a plus). Currently we have been asked to recruit

**SYSTEMS ANALYST**  
up to £6250

With upwards of one year's practical analysis experience (on any mainframe and on any non-scientific applications). The successful candidate is unlikely to have less than three years computing experience in all, should have a sound educational background, and be capable of leading a small team if required. (Ref. 884W)

**TRAINEE ANALYST**  
up to £5100

This is an opportunity for a well-educated Programmer or Analyst/Programmer with around three years' experience on any mainframe to progress to systems analysis work. Alternatively, our clients would consider a recent GRADUATE with a good degree (ideally computer science), at an appropriately lower salary level. (Ref. 880W).

The successful candidates will be working in small teams on an extensive schedule of new development work at a major West End installation. Appropriate training in advanced techniques such as database and communications will be given, and career prospects are good, in a well organised, expanding installation, using the latest mainframe equipment and modern operating systems. COBOL is the main language.

We would like to tell you more about these first class career openings. Please ring us in confidence for an initial exchange of information, quoting the appropriate reference. Alternatively, leave a message on our answering machine after hours or write briefly.



Tel: 01-637 5796  
**EDP Systems**  
52-53 Margaret Street  
London W1N 7FF

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Salary Negotiable + Fringe Benefits

Our earlier advertisements attracted some key people to join our projects in Hampshire but we have additional opportunities for the right people now.

We are a life insurance and unit trust Company and we are growing fast - we need sophisticated systems to support our continued expansion. We are committed to developing an integrated insurance system to replace all existing systems using modern technology such as database, real-time on-line facilities via VDU's etc. on our new Burroughs B3800 system.

We can offer a stimulating career and first-class rewards to those who can help us in our ambitious plans. We have opportunities now in software development, systems analysis and in application programming. We are looking in particular for experience in the following fields -

Real-time applications  
Database technology  
Burroughs Medium systems

We would like to hear from you. Those of you who join us will enjoy a comprehensive package including competitive salary, plus mortgage subsidy facilities, non-contributory pension, life insurance and permanent health schemes. Generous relocation expenses will be available for those who move to join us.

Take these advantages seriously. 207 or write now for an application form to:

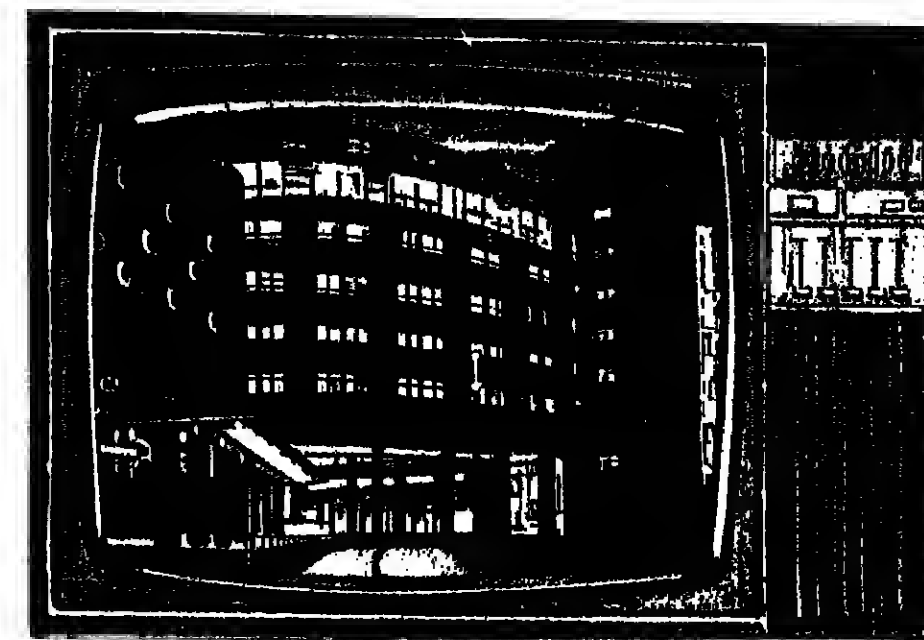
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or Tel 01-723 5334

## SYSTEMS ANALYSTS &amp; PROGRAMMERS

## Come to an Open Evening at Television Centre on Wednesday, 31st May, at 6.30pm.



The BBC would like to invite business orientated Systems Analysts, and also Programmers, to an Open Evening on Wednesday, 31st May at 6.30pm. Meet us at Television Centre, Wood Lane, Shepherd's Bush (opposite White City Central Line Station). The purpose of the visit is to explain the role of computers in Broadcasting today, and includes a brief tour of Television Centre.

Our application areas include aids to Production and Transmission Planning, Management Information

Systems, and Financial and Stock Control Systems. We think you'll find the visit extremely interesting, particularly if you're a Systems Analyst concerned about solving user problems, with 3/5 years experience; or a Programmer with 2/3 years experience with ICL equipment and writing COBOL programs in a business environment.

However, if you can't come along, write or telephone, Appointments Dept., BBC, London W1A 1AA, quoting reference no 78.G.1307 CW. Tel: 01-580 4468 Ext: 4619.

**BBC**

## NORTH WEST THAMES REGIONAL HEALTH AUTHORITY REGIONAL COMPUTER SERVICE

### COMPUTER INSTALLATION MANAGER (Scale 23)

(Male or Female)

SALARY SCALE: £8,700-£8,047

PER ANNUM

(INCLUDING LONDON WEIGHTING AND SUPPLEMENTS)

The successful candidate will be accountable to the Regional Computing Services Officer for the general professional standards of staff, as well as the overall control and co-ordination of computer operations in the Region. He/she will be responsible for the maintenance and security of the computer premises, products, equipment and records, and for the satisfactory functioning of secretarial and administrative matters. A large ICL 1804S computer with EDS 80 discs is installed and has been in regular use for some years. Applicants should have a sound managerial ability. Application form and further particulars from the Regional Personnel Officer, North West Thames Regional Health Authority, 40, Earlborough Terrace, London W3 3QX (Telephone No. 01-362 8011 Ext. No. 261), returnable by 10th June 1978 quoting reference number 384/CW/23/A. Applicants from outside the service start at the minimum of the scale.

## DO YOU TALK OUR LANGUAGE?

An exciting opportunity has arisen for an Analyst/Programmer to be involved in the development of an on-line system.

Having successfully operated with an IBM System/3 for several years, we are now installing a much larger machine to serve 17 VDU's.

The Analyst/Programmer will work closely with the d.p. manager in the design specification of the new system; in directing the work of junior programmers; and in liaising with new user departments.

Our language is RPG2; but other relevant high-level language experience will be considered.

We are the country's leading independent poultry processors and employ some 1,100 people in the East Midlands.

Our Lincolnshire base is in a pleasant, low cost rural housing area. We can offer responsibility and job satisfaction in a progressive, expanding company at a salary in the range of £4,500-£5,000. Other large company benefits apply, including relocation assistance.

Please write, giving full details, or telephone for application form to:-

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COMPANY PERSONNEL MANAGER  
6, W. PADLEY LTD., ANWICK  
SLEAFORD, Lincs  
TEL: (01509) 832661

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A 2-year contract in TEHRAN then back to work for one of the UK's top management consultancies. Full career development on completion of contract.

## DMS/TIP/CMS CONSULTANT

To advise on the use of these 1100 software components in the design of on-line database banking systems. Total familiarity of their software properties and applications interfaces required. Banking experience NOT required.

## CONSULTANT ANALYST

To advise on on-line banking systems in a large Univac 1100 environment. Plenty of "hands-on" duties. Banking experience essential.

REF RW 21/3

# REAL-TIME SOFTWARE DEVELOPMENT

## Industrial Applications of Real-time Minis — Home Counties

This company is a world leader in real-time process control systems. Increasing sales give rise to the following staff requirements in the Software Development Department.

## TEAM LEADER (Interactive Languages)

£7-£9 K (+ Reloc)

This is a senior appointment leading a team developing interactive language compilers.

## SOFTWARE DESIGNERS £4-7 K (+ Reloc)

A number of attractive vacancies exist for software designers with various levels of experience in the following areas:

- Micro-processors
- Operating Systems
- Process Control Applications

This is a first-class opportunity to exercise your skills with a growing organisation in a rapidly expanding market.

To find out more, Phone TONY BAKER on 01-499 4501.

REF RW 21/4

# OEM PERIPHERALS/TERMINALS

Our client is a British major in the manufacture and sale of computer peripheral and terminal equipment. They have a large and growing customer base, both at home and abroad, to whom they supply competitive products of the most up-to-date design. The company has been trading for several years and has consequently established a sound commercial base.

Profitable business to date enables the company to double its turnover (currently £12m) every 5 years. To meet and surpass this growth rate the management has decided to enlarge the marketing force by creating exciting career openings, detailed below.

To discuss these opportunities, please telephone TONY BAKER on 01-499 4501, or write to him at the address below, quoting the appropriate reference number.

## SALES ENGINEERS

Vacancies now exist for three sales engineers to join the existing sales force in Britain. Based in Northern England and the London area, two of the sales executives appointed will manage and develop customers and prospects in a defined territory. They will sell the complete product range, and to do this successfully, will need to have a successful track record in sales, coupled with an engineering background or similar. They will, of course, be disciplined and self-reliant individuals.

The third executive will be Head Office based (West of London) and will handle general enquiries. This appointment might suit a young individual with an engineering background wanting to make his/her entrance into sales.

There is an attractive benefits package, including a generous commission scheme, a company car and a base salary of £8-£7,000. Realistic earnings on quota will be in the range

£9,000 - £11,000

REF RW 21/1

## APPLICATIONS ENGINEERS (Sales Support)

To support the substantial sales effort of the sales force, the management has decided to engage two further SALES SUPPORT ENGINEERS to support customers and salesmen in both pre- and post-sales situations.

These positions call for youngish people with an engineering (or similar) background, who have the desire and capability to work in a front-line capacity. The engineers are called upon to provide a technical back-up to the sales executives to optimise their success, and to ensure a high level of customer satisfaction. Candidates must therefore be articulate and self-disciplined as well as possessing a high level of technical competence.

(If you can demonstrate practical managerial talent, then it is possible that this could be put to good use from the outset).

£5,000-£5,500 + Car

(c £6,500 + Car

for a Manager

REF RW 21/2

# hutchinson-scoggins recruitment

10 Dover Street London W1X 3PH  
Telephone 01-499 4501

## Successful candidates will be flown out, at CDC expense, for a 1 week exploratory visit.

Control Data Corporation has been established in South Africa for 14 years. A reputation for stability and growth has been won principally because specialists have been carefully integrated so that each can develop whilst positively contributing. CDC is situated in Sandton City, one of Johannesburg's most prestigious office blocks, in the pleasant northern suburbs. Luxury housing plus excellent shopping and social facilities are on the doorstep.

The following positions offer negotiable salaries in the range R16 000 to R18 000 per annum plus extensive benefits. A guaranteed air fare valid after 3 years service is also provided should any candidate prefer not to accept a permanent position. In addition all air fares and goods shipment will be paid. A generous settling in allowance will be provided.

## Systems Software Support Cyber mainframes

Duties involve the installation and maintenance of operating systems on large dual Cyber installations. This will include liaison with the training of user software teams.

Candidates should have at least 3 years experience with CDC operating systems such as KRONOS, SCOPE, NOS and NOSBE. A high degree of technical competence is obviously required as well as the ability to carry substantial responsibility.

## Communications Software Analyst

We have installed dual Cyber mainframes that have additional communications facilities for a user who has unique and diverse requirements. The challenge will be to install and maintain the operating system whilst ensuring that all the customer's software needs are catered for.

Candidates should have at least 3 to 4 years experience in the maintenance of an operating system (or part thereof) coupled with exposure to data communications software that has been interfaced with a host system.

## Senior Analyst Data Base Systems

This person will perform a liaison role with a major user in addition to handling the interface with CDC software groups in the USA.

Candidates must have a wide and deep knowledge of data base techniques, not necessarily on CDC mainframes.

Andy Lawrence, Personnel Manager South Africa, will be interviewing on the 7th, 8th and 9th of June in London.

Please write to him submitting full career and personal details c/o Control Data Limited, 79 Wells Street, London W1. Please send your resume by express post.



CONTROL DATA

MORE THAN A COMPUTER COMPANY

## programmers/senior programmers Sheffield/Huddersfield.

Salaries — programmer c £4000; senior programmer c £5000  
Due to our success and rapid growth, we are looking to recruit programmers and senior programmers for our Sheffield and Huddersfield centres.

The successful candidates will be competent programmers with two years plus ICL 1900/2900 experience (three years for the senior grade). Preference will be given to applicants with COBOL and TABN/ELT6 experience. At the senior grade team leadership is indicated. If you consider that you have the necessary qualifications and would like to work in a challenging and rewarding environment, ring me at 0742 730406 or send me brief career details.

Malcolm Needham, Software Support Manager, Hoskyns Systems Ltd, Thos. W. Ward Building, Saville Street, Sheffield, S4 7UL.

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A well-known company with over 600 professional staff.  
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MID HAMPSHIRE  
A major commercial ICL G11 user is expanding its present large installation to the 'new range' ICL equipment and requires additional operating staff who will get the opportunity of working on the latest computers. Their perks include relocation expenses and subsidised Restaurant, etc. CW21/1 Patricia

### SNR. OPS./OPERATORS £4000 to £5500 inc.

N LONDON  
A major IBM 370/OS user is offering really excellent perks including high salary and paid overtime plus paid removal expenses. You must have a minimum of 1 year's OS experience though. CW21/2 Patricia

### SHIFT LEADER £4,500 inc.

E LONDON  
If you are looking for career progression with very good promotional prospects then apply now. Excellent IBM OS/VS installation with company benefits like 4 weeks' holidays. Non C.P.S. and a subsidised canteen. CW21/3 Patricia

### HARDWARE TECHNICIAN C. £4,700

W SUSSEX  
Applicants are required to control the Hardware side of the major IBM & ITEL installation. They will provide control over the CPU, discs, tapes and standby generator, etc. The installation belongs to a major commercial company with three other large IBM computers in the UK. There is paid overtime on top of this days only job. Relocation expenses paid plus other large company perks. CW21/4 Michael

### JUNIOR PROGRAMMERS £3,000 to £4,300 SE ENGLAND

You have only 1 year's commercial experience? Then you are in great demand. We have a large selection of first-rate companies who need people like you. Some offer mortgage assistance to the right candidates after short period with them. CW21/5 Annette

### MINICOMPUTER PROGRAMMERS £4,000 to £7,250

LONDON & HOME COUNTIES  
If you have experience in ASSEMBLER or micro-code or communications for at least 1 1/2 years then a whole exciting field is open to you. We now have opportunities in SW, NW or W London, Surrey, Dorset and Hertfordshire for competent people in this rewarding field. The future is definitely going to be with the MINI-computer Professional. Telephone for details. CW21/6 Michael

### SYSTEMS PROGRAMMER £7,600 CROYDON

You're lucky. You could be working on one of the first 3033 installations in the country, shortly arriving. At present this major industrial user has the latest IBM 370 CICS/VS, VTAM, CMS installation. They require a systems programmer with good T.P. experience that will only benefit from a job on the latest equipment. CW21/7 Annette

### FREELANCE PROGRAMMERS To £260 p.w.

MINI-ASSEMBLER ESSEX 3 MONTHS  
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c £5,300

A minimum of 18 MONTHS' COBOL experience, gained on any machine, could secure you a rewarding future within the expanding data processing department of a major International organisation. The Company operates an IBM 370/168 under OS in Texas with links to the U.K. and Europe. On-line processing and systems development are used extensively, offering the successful candidates the opportunity to be trained and enhance their career in this area.

The persons appointed will program, test and implement systems with the minimum of supervision. This will entail close User contact, particularly during the latter stages of the project. Career prospects are excellent and a limited amount of travel will be available.

Located in modern, air-conditioned offices, the company's terms of employment include an annual bonus, a non-contributory pension scheme and paid overtime.

Ref. S1/2505

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## Edmund Howard's Client Album

## PROGRAMMERS

SNR. PROGRAMMERS  
ANALYST/PROGRAMMERSEUROPE  
& UKSalaries to £16,000  
Salaried to £10,000

Many of today's most sophisticated scientific systems are being developed on mini computers and microprocessors. This development has, in turn, created a demand for specialist expertise of a very high order. It is therefore essential that candidates should hold a degree in a scientific discipline coupled with at least two years' experience of real-time computer systems. A working knowledge of either CORAL ASSEMBLER and/or FORTRAN is required.

Projects range from Space, Avionics, Defence and Military systems through to Data communications, Computer Networks and message switching systems. Computer specialists with first hand experience of scientific systems will welcome this opportunity to participate in one of the most creative modern areas of modern Data Processing. For further details please quote CW185.

TECHNICAL AUTHOR  
HERTS. & BERKS

£6,500 +

A leading computer equipment manufacturer is currently seeking a Technical Writer with flair and imagination to work in close association with the product development and software design teams. It is essential that candidates have had some previous experience of technical specifications and software manuals. For further details please quote CW188.

BASIC SOFTWARE DEVELOPMENT  
LONDON, HOME COUNTIES & THE SOUTHGraduates  
Programmers  
Project Leaders£3,000-£4,500  
£5,500-£7,000  
£6,000-£8,500

We have a wide and varied selection of software vacancies throughout the south. All our work leading to mainframes and software installations. If you are experienced in any of the following areas we would be pleased to hear from you: Operating Systems, Transaction Processing, Compilers, DBMS and Software products in general. For further details please quote CW186.

COBOL & ASSEMBLER  
PROGRAMMERS

S.W. LONDON/SURREY

Salaries to £6,500

A major financial organisation is presently seeking experienced programmers to participate in the latest stages of expansion involving the design and development of a wide variety of new systems. Applications programmers should possess a thorough knowledge of COBOL preferably gained in an IBM based environment. Systems programmers should be thoroughly conversant with ASSEMBLER. A minimum of two years' programming experience is essential. These attractive positions, along with excellent company benefits, offer security and job satisfaction to progressive career minded individuals. For further details please quote CW189.

PROGRAMMERS, CONSULTANTS  
HOLLAND

Salaries to £16,000 +

A major independent Dutch Consultancy with a highly impressive track record in commercial data processing is currently recruiting experienced computer personnel to work in Holland on either short or long term assignments. Requirements are broadly based and cover financial, accounting/insurance systems on a wide variety of hardware including IBM, ICL, Honeywell, Burroughs, Univac, DEC Nova and DEC. These appointments will appeal especially to those wishing to broaden their experience in a very competitive area, demanding as it does a high level of dedication and professionalism. For further details please quote CW187.

FREELANCE  
NATIONWIDE

A number of our clients often require contract or freelance personnel for short term assignments. So if you are between jobs or just finishing your current contract it would certainly be worth while getting in touch with us. For further details please quote CW190.

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Computer Personnel Consultants

1 Brighton Road, Surbiton, Surrey. Telephone 01-899 9183  
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## TSB TRUST COMPANY LTD

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Salary Negotiable + Fringe Benefits

The TSB Trust Company, the Life Insurance and Unit Trust subsidiary of the Trustee Savings Banks Central Board is situated in a modern office in Andover in the Hampshire countryside.

The Company has enjoyed an exceptional growth rate and is committed to computing, as the prime tool for operating and managing the Company.

A Burroughs 6380D has been delivered and existing systems are being transferred to it from bureau machines.

An opportunity exists for a commercial systems analyst to support the establishment and enhancement of these "in house" systems. The Company is also embarked upon the development of an ambitious integrated insurance system with real-time characteristics and the successful candidate will have the opportunity to become involved in this activity in the future.

The Company offers a competitive salary, plus mortgage subsidy facilities, non-contributory pension, life insurance and permanent health scheme. Generous relocation expenses will be available if necessary.

Telephone Andover 62188 Ext. 207 or write for an Application Form to:

Diane Smith, Personnel Department,  
TSB Trust Company Limited,  
P.O. Box 3, White Bear House,  
21 Chantry Way, Andover, Hants. SP10 1PG.

TSB

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D.P. Support Services now require experienced Data Controllers, Operators, and Senior Operators for operations support, to assist us in fulfilling various user requirements on both short and long term contracts.

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£4500 to £5500

Join us as a Business Systems Development Consultant at our showroom in the West End. Applicants should be experienced in general Business Applications with either a Sales or Systems Background, and will preferably be able to program in BASIC.

Salaries between £4500 to £5500 are offered, dependent on experience.

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QUEEN ELIZABETH COLLEGE  
(University of London)  
Computer Unit  
Kensington, London W8 7AH  
ADVISORY  
PROGRAMMER

Applications are invited for the post of Advisory Programmer in the Computer Unit. The Unit has a substantial Modern Data system connected to the CDC Computers at the University of London.

Office control of taking part in the programming advisory service and in the design of some service programs for users. Priority in terms of salary, starting date, and other conditions, will be given to those who have completed a 12-month course in the 1977-78 academic year. The Unit has a substantial Modern Data system connected to the CDC Computers at the University of London.

TECHNICAL ASSISTANT  
(COMPUTER)

GRADE AP to 501 (£2,083 to £5,085 p.a. inclusive of supplements)

Applications are invited from persons with programming experience in COBOL for the above post in the finance department. The Council at present operates an ICL 2900 financial data base for the University of London. The successful candidate will be responsible for the maintenance and expansion of this system in the near future. The successful applicant will be expected to perform some computer programming and operation tasks from time to time.

Application form and job description may be obtained from the undersigned and should be returned to him not later than 12th June 1978.

DEPARTMENT OF FINANCE  
ACCOUNTANCY ASSISTANT

Grade AP4 (£3,581-£4,214 p.a. inclusive of supplements)

Applications are invited from persons previously qualified to the minimum standard of the C.I.P.F.A. Duties of the post include responsibility for day-to-day operations of the Council's financial transactions. Applicants must be able to work with a minimum of supervision.

Application forms and job descriptions may be obtained from the undersigned and should be returned to him not later than 12th June 1978. Copying of members of the Council or any committees directly or indirectly will disqualify the candidate concerned and any application should also disclose any relationship in a Senior Office at the Council.

Head of Personnel and Management Services  
CARRBANK, MANCHESTER, NOTTINGHAM

Systems Analyst/  
Programmer

Can you accept a challenge?  
c. £5000

A Systems Analyst/Programmer is required with experience of POP 11/34 to work on Commercial Systems. Experience of RST-A/E operating system would be advantageous.

This is an opportunity for the right person to design systems and programmes from concept to implementation.

We are specialist Civil Engineers about to install a new Department and now require a Commercial man or woman to work on our Accounting Systems.

Salary around £5,000 together with other benefits. Please write or telephone.

Mr R. S. Kenrick

Soil Mechanics  
Eastern Road, Bracknell, Berkshire, RG12 2JF  
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## PL1 PROGRAMMERS

City

£4000-£6000

If you have two years commercial experience in a large IBM installation our clients would be very interested in hearing from you. They are in the process of installing a second 370/158 and their future plans include an increasing use of IDMS and the extension of their current TP network. Any CICS and/or Database experience would be a distinct advantage. The company offers an attractive starting salary, excellent conditions of employment and plenty of opportunity for rapid career advancement.

Reference JC 21/1

## FORTRAN PROGRAMMERS

London

£4000-£6500

A major engineering company located just south of the river near London Bridge Station require an experienced Fortran programmer. The suitable applicant should have a degree in Applied Mathematics or Engineering and at least two years experience in Fortran, preferably on IBM equipment.

Liaising with users and other programmers you would gain experience in Scientific Applications, Stressing, Thermo Dynamics etc and could expect good career progression and an above average salary.

Reference SD21/2

## ANALYST/PROGRAMMERS

Central London

to £6000

If you are looking for a challenge, you should be interested in a position with this large retail company. They operate an IBM 370/145 under DOS/VS and are currently developing a complete Database System using IMS.

The company requires several Analyst/Programmers with a minimum of 18 months experience in COBOL, although any knowledge of ASSEMBLER would be an added advantage. Experience of any DB package, but particularly DL/1, would be of special interest.

In addition to highly competitive salaries, the company offers free lunches, free Life Assurance and discount on goods.

Reference PG21/3

## COBOL PROGRAMMERS

City

£4000-£5000 plus Mortgage

A major financial organisation with an expanding ICL 2900 system is seeking several programmers for their city based installation. These positions will be ideal for people with at least one years commercial experience gained preferably on ICL equipment. The company offers a high starting salary and an excellent benefits package including Season Ticket Loans, Flextime and a Mortgage Subsidy Scheme.

Reference JC21/4

## RPG 11 PROGRAMMER

City

£6000 plus Mortgage

An international banking group with a small DP department are seeking an experienced Analyst/Programmer who can select and lead a team of three programmers. Personal qualities are obviously important, as is a knowledge of IBM System 3 equipment, however the main requirement is for not less than 3 years RPG 11, coupled with solid Analysis experience. Any knowledge of either banking or CCP would be of added interest.

A high basic salary is envisaged, together with an Annual Bonus, Personal Loan Plan, and a 2½% mortgage scheme.

Reference PG21/5

## COMMUNICATIONS PROGRAMMERS

Hertfordshire &amp; North Kent

£4000-£8000

A market leader in computer based communications equipment have a number of opportunities for engineers and programmers in the following areas.

Real Time  
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Data Communications

Experience in any of the above, possibly coupled with a degree, would lead to an excellent salary together with a generous benefit package which includes Flextime, 24 days Holiday, L.V.'s, Generous relocation expenses and Subsidised Company products.

Reference SD21/6

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## PROGRAMMER

N. LONDON "Progress to Analysis" £4500-£5000

Our Client is seeking an ambitious programmer able to offer a minimum of 18 months experience, preferably using COBOL, and keen to progress rapidly to undertake greater applications project responsibility.

- In return our client is able to offer
- \* Positive career progression leading to analysis.
  - \* Development of new systems in an expanding department
  - \* The latest equipment and software products
  - \* The opportunity to play a major role in the Company's three year development plan.

This is an outstanding career opportunity for a young programmer to establish excellent foundations for a successful career in data processing. Telephone or write now for an early interview.

Ref N4/2505

SYSTEMS & PROGRAMMING  
CONSULTANCYPROGRAMMERS LONDON/BUCKS To £6750  
SYSTEMS ANALYSTS To £7500

Join this dynamic systems house currently in a phase of controlled growth. Opportunities to gain experience with a variety of machines and systems makes this an ideal move in the career path of programmers and analysts with 2-3 YEARS commercial D.P. experience.

If you would like to sample several different installations and receive a sound training in professional systems consultancy, this Company offers attractive terms of employment, with projects throughout London and the Home Counties.

Ref W1/2505

BROADEN YOUR HORIZONS  
Near CROYDON Analyst/Programmers To £6000

Two additional Analyst/Programmers are required to augment our client's busy systems and programming department and assist in the development of a wide range of new applications.

The computer centre provides unusual and interesting commercial data processing facilities for various applications and users. Working with advanced software products and in professional standards candidates should offer at least two years' COBOL experience and can look forward to gaining involvement in analysis and, in some cases, holding responsibility for small projects.

The Company provides its employees with extremely good conditions of employment and considerable scope for career advancement. Generous commencing salaries will be offered in a range to £6000 p.a.

Ref N3/2505

## PROGRAMMERS

C. LONDON "On-Line Systems" To £5500

If you have around 2 years' COBOL experience this is an excellent opportunity to join a major British organisation for whom you will produce new systems, using a new machine, and have positive career openings available to you.

The Company provide specialist services to all types of industry and their continued expansion has created the need for additional programmers to assist with the development of a complete range of on-line applications over the next few years.

Joining new project teams the successful candidates will be encouraged to progress to Analysis or Systems Programming in a large T.P. environment.

Based in Central London close to all forms of transport the company provides good conditions of employment including Pension Scheme, LV's, 4 weeks holiday and regular salary reviews.

Ref N2/2508

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# Programmers Systems Analysts

The Aircraft Group of British Aerospace has vacancies in various departments of its Warton Division for Programmers and Systems Analysts.

## COMMERCIAL VACANCIES

in our Divisional Spares Department based at Samlesbury

### PROGRAMMERS

With 2 to 3 years' general programming experience are required to join a small team engaged on the development of commercial systems concerned with the procurement and delivery of spares. COBOL experience is essential and a knowledge of I.B.M. O.S. operating systems is preferable, but training will be given to successful applicants.

### SYSTEMS ANALYSTS

With 3 to 4 years in Data Processing are required to join a department responsible for commercial systems development for all aspects of spares supply. The job will involve user and customer liaison, design and specification of systems, their implementation and on-going support.

### SYSTEMS PROJECT LEADERS

are required to lead teams of analysts and programmers on major projects, from conception to implementation. They will be responsible for all aspects of project management, including a high degree of customer liaison.

Suitably qualified men and women are invited to write for an Application Form, quoting Reference No. CW/41781a.

## SCIENTIFIC VACANCIES

in our Flight Test Department based at WARTON

### APPLICATIONS PROGRAMMERS

with 1 and 2 years' experience using FORTRAN.

### SYSTEMS PROGRAMMERS

with at least one year's direct experience to join the team working on an ICL2960 System (running under VME/B) which is to be delivered in the Autumn.

Suitably qualified men and women are invited to write for an Application Form, quoting Reference No. CW/51781a.

There is a choice of rented housing at attractive prices in pleasant residential areas near Samlesbury and within comfortable commuting distance from Warton.

Mrs. E. A. Hall,  
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Warton Division

## Programmers and Systems Analysts

Programmers negotiable circa £4,500 p.a.  
Systems Analysts negotiable circa £5,000 p.a.

We are part of a major international corporation with insurance interests throughout the world including state companies in Holland and Germany.

We are currently operating on IBM 370/138 with DOS/VSE and Power V/S using interactive techniques. This hardware is soon to be upgraded to a 148 and 3380's will be installed by July.

We are now expanding our commitment to the systems and data processing functions. We need experienced people to be immediately involved in the development of several wide-ranging projects including data base management, telecommunications, structured and interactive programming using COBOL as the main language.

Our main office block is set in beautiful grounds at the foot of the South Downs where we have a pleasant sports and social club with swimming pool and full sporting facilities. We offer full education expenses, a non-contributory pension scheme and free life insurance. Flexible 26-hour week, night discounts, LVS and a subsidised canteen. There is also a mortgage subsidy scheme in operation after a satisfactory service period.

If you have a background with knowledge in finance and would like to work in a pleasant environment, please telephone Frank Warton, Personnel Officer at 01484 200000. Alternatively, send us your Personal Data Sheet, enclosed, quoting The Vacuum, Woking, West Sussex GU24 0DD.

EXCESS  
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## SALES EXECUTIVE LONDON Up to £12,000 + 2 ltr. car

Our client is an established U.K. Software House with an impressive record of growth, success and innovation.

Due to internal promotion, they have an immediate requirement for an experienced Sales Executive, based in London, who will be responsible for selling systems and programming consultancy services, plus proven packaged systems to industry and commerce.

Applicants should be able to demonstrate a sound knowledge of the computer services market and have a successful record of selling to first time/established computer users.

A generous negotiable basic salary plus an excellent commission scheme will give potential earnings of £12,000 p.a. but there is no upper limit on total remuneration.

A company car is provided and fringe benefits include free BUPA and Life Assurance.

Applications which will be treated with strictest confidence; should quote ref no. RRC128 and be made to:

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## Systems Analysts for Manufacturing

BOC is a world leader in the manufacture of gas welding products. Our manufacturing operation is one of the most modern and advanced. There is much that is new in the field of engineering to be seen at our plant in Skelmersdale. Our target has been to achieve flow production for high volume lines; to move closer to on-site engineering; to reduce work-in-process; to produce engineered goods at the lowest possible prices and to gear up for fast, reliable deliveries.

We need Systems Analysts who are capable of making a major contribution to this environment.

We already have an advanced online stock and order processing system and our record of development to date is one of which we are proud.

We now seek two people, one who can demonstrate leadership qualities and another with his experience.

If you think you can match our high standards, telephone or write to Ian Pearson, Systems Manager, BOC LTD, Pool Road, Skelmersdale, 24124.

**BOC**  
Engineering Division

### EUROTECH BELGIUM S.A.

A member of the Cable and Wireless Group, requires for its Brussels-based communications centre,

### PROGRAMMERS

C. £8,000 - £12,000

& cost of living index

& one month's salary annual bonus

& extra 1/2 month salary holiday pay

& overtime pay

& 20 days' annual leave (plus 12 public holidays)

& luncheon vouchers

& the successful applicants will be eligible to apply for tax concessions.

Applicants should have experience in communications mainly message switching on mini or micro computers and be familiar with Assembler programming.

Please write or telephone for more details and an application form to

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Sovereign

1180 Brussels

Belgium

Tel: Brussels 02/880.48.50.

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Several contracts, 1200

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### UNIVERSITY COLLEGE, CARDIFF School of Computing Science S.S.A.O. RESEARCH STUDENTS

Applications are invited from

Computer Science, for research students in

July 1978, good honours degree in

Computer Science, and the following studies

in the following areas:

1. Systems (2)

2. Software (2)

3. Hardware (2)

4. Systems and Software (2)

5. Systems and Hardware (2)

6. Systems and Software and Hardware (2)

### WHITBREAD FREMLINS LIMITED



## COMPUTER OPERATOR—KENT

We have a vacancy for a Computer Operator with at least 1/2 years' experience on disk based systems preferably on Honeywell Level 64's or an integral part of the company's development of advanced D.P. Systems and networks, and therefore experience of communications would be a distinct advantage.

A 2-shift system, 5 days a week, is worked and a good basic salary with fringe benefits is offered. If you are interested please write to me for an application form, Diana Crowley, Personnel Officer, Whitbread Fremlins Ltd., Earl Street, Maidstone.

### TURNKEY SYSTEMS SALESMEN VARIOUS UK

£10000-£15000 earnings

EMS has just embarked upon a major new diversification with a £2.5m capital investment project, starting initially with a large sophisticated Data Centre just opening in Birmingham with additional regional centres to open throughout the U.K. during the next two years. Each centre has large hardware development and demonstration areas and numerous software/applications systems development areas. EMS initially will be embarking on a dual system approach marketing both Honeywell Level 8 and ICL 7502a linked to our own mainframes. Equally, substantial investment in package development has been initiated, with teams already at work on a wide range of applications projects. We urgently seek only experienced salesmen capable of working on the promotion of hardware and software systems, with an adequate knowledge of application requirements. EMS have a specialist division dedicated to customer support able to take a large amount of conventional software assessment away from salesmen enabling them to substantially increase their marketing availability. We envisage highly motivated salesmen being of sufficient calibre to present equipment to seminars of clients numbering up to 100 as well as to negotiate without support on occasions at client board level. Earnings should be very attractive for experienced salesmen.

Consultant: John Wood.

### 1,000 COBOL/ASSEMBLER PROGRAMMERS U.K.

£3500-£6000

EMS currently has over 1,000 vacancies all at an urgent nature throughout the U.K. including a large quantity within London and the Home Counties, West Country, West Midlands, North-West, Yorkshire and Scotland. A vast choice exists for all applicants irrespective of location. Vacancies are being notified to EMS at the rate of 200-300 each week. Why miss out on this vast market selection for yourselves. Join thousands of other satisfied EMS users — let the professionals get early results for you. It doesn't cost you anything. With six months' experience upwards, complete the attached application form today.

Consultant: Selma Miller/Carol Prudman.

### IBM ASSEMBLER PROGRAMMERS LONDON, NW1

To £5000

A major IBM user, with extensive on-line and real-time networking has urgent requirements for numerous additional programmers to work on the current multi-user system and to assist with ongoing development work. Many fringe benefits exist for experienced ASSEMBLER programmers including low cost international holidays, etc. Equally, early career progression is possible for motivated programmers. Don't delay, complete our application form today and we will have you in interviews within five days with lucrative offers to follow if your experience is suitable. Equally, we have many other Reserve ASSEMBLER positions throughout the UK for you also.

Consultant: Don Philip.

### ANALYSTS & PROGRAMMERS BIRMINGHAM TO £5500

The EMS Data Centre at Fiveways, Edgbaston, is currently expanding the Turnkey Systems Division to cope with substantial applications and package development across all business areas. Subsequently, we need experienced, motivated staff able to work to agreed schedules and switch from one applications project to another as directed by Management. Analysts should hold a current driving licence to enable them to make regular visits to U.K. clients in order to discuss individual requirements. Programmers must have COBOL knowledge. Full on-the-job hardware training will be supplied by EMS at our Data Centre for suitable candidates.

Consultant: Dennis Filly/Danien Handford.

### IMS DESIGNERS AND PROGRAMMERS TO £8000

We currently have large quantities of vacancies throughout London, Home Counties, Midlands and Northern Counties for key staff with previous IMS involvement, either in industrial or commercial environments. Equally, we are offering opportunities to work on a large data bank of EMS clients throughout the UK, untravelling elsewhere. With IMS or PL/I experience, simply complete the attached application form and let EMS rapidly get interviews arranged and early results for you.

Consultant: Neil Bradley.

### EMS CONSULTING CAREERS

The Group has a range of career development opportunities second to none in the UK, covering all ranges of employment from front and consultancy to back end package development. Facilities Management and Applications Development at our regional Data Centres.

EMS Consultants are currently working throughout the entire UK, assisting such clients as Government Agencies, Electrical Manufacturers, Bureaux, Distributors, Chain Store Groups, Engineers and Mini-Computer Stand Alone or Network Users. EMS in addition have the only large Data Centre Development unit in the country, based in Birmingham and accommodating up to 150 people. Futuristic training and demonstration facilities have been incorporated within this unit. All work station desks have their own terminals incorporated for program development where appropriate. Extensive package design and development is already in progress to support our Honeywell Level 8 Turnkey Systems sales. We offer wide diverse applications involvement. In all trading areas with the opportunity of UK or international travel, if required. Conversion training to Honeywell hardware will be supplied for otherwise acceptable candidates. Without doubt, EMS will be the place to be during the 1980s. Join now and secure a Managerial position early with a rapidly growing market leader.

### ANALYSTS & PROGRAMMERS LIVERPOOL

To £6500

A major distribution organisation have expanding requirements for more experienced staff to work on a wide variety of commercial projects. Some projects currently being developed include stock control, distribution systems, point-of-sale, sales order processing, depot stores accounting and payroll. Many projects incorporate on-line working. Data-base systems are also being developed within the group. Our client has a vast hardware commitment offering scope to work on any of the latest machines in Europe. Complete the attached form for an early interview.

Contact: Denis Filly.

### ANALYSTS — STAFFORDSHIRE TO £6000

A large processing group of national repute, has 10 systems vacancies for Analysts with a minimum one year's experience. The group has a wide series of advanced, sophisticated management information systems currently operating and plan further continuous enhancements. A knowledge of PL/I or BAL would be useful although not essential. Excellent management appraisal and training schemes exist within the group offering candidates the opportunity of gaining diverse and valuable management services training. In addition to attractive salaries, various fringe benefits are available and adequate relocation assistance. Housing availability within the region is adequate and sensibly priced. Again, the management appraisal and training scheme exists within the group offering candidates the opportunity of gaining diverse and valuable management services training. In addition to attractive salaries, various fringe benefits are available and adequate relocation assistance. 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**TO £4500**

## TIMESHARING SALESMEN MIDLANDS & NORTH

**TO £8000**

**OOS COBOL PROGRAMMERS  
KUWAIT £8500 +**

**£8500 + +**

**ANALYSTS/PROGRAMMERS**  
**COBOL**

**TO £5000**

## IBM PROGRAMMERS & OPERATORS

**WEST MIDLANDS NEGOTIABLE**

## PROGRAMMERS TO ANALYSTS LONDON BANKS

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**SYSTEMS MANAGER IBM SYS.3  
NORTH LONDON TO £6500**

**TO £6500**

**DEVELOPMENT ANALYST**  
**WEST YORKSHIRE**

**WEST YORKSHIRE TO £5500**

ANALYST/PROGRAMMERS  
SURREY TO 2

**TO £7000**

## APPLICATIONS & PACKAGE

**DEVELOPMENT  
BIRMINGHAM TO £5500 A**

## COBOL PROGRAMMERS LONDON & HOME

**COUNCILS** **£4000-£5500**

## IMS DESIGNERS AND PROGRAMMERS

**TO £8000**

**ANALYSTS & PROGRAMMERS  
SURREY NEGOTIABLE**

**CONSULTING  
PROJECT MANAGERS  
VARIOUS U.K.**

**TO £8000 P.A.**

**HONEYWELL TDS/IDS COBOL  
U.K. TO £7000**

**TO £7000+**

**KUWAIT  
ANALYSTS & PROGRAMMERS  
COBOL/ASSEMBLER**

**TO £13000 p.a.  
+ ACCOM.**

**HONEYWELL ANALYSTS &  
PROGRAMMERS  
NUMEROUS H.K. TO E**

**TO £7000**

**ANALYSTS/PROGRAMMERS  
STOKE ON TRENT** c £5000

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SURNAME											
Other Names											
Address											
Telephone											
Home											
Bus.											
Post Code											
Eti											
Age		Date of Birth		Place of Birth		Nationality		Height		Weight	
Married		Children		Car Owner		Driver		Nature of any Serious Illness			
Position Required										Required Salary Rate	
Present Position										Salary	
WHERE DO YOU WISH TO WORK											
Within U.K.		Yes/No		Acceptable Areas				Abroad		Yes/No	
Will you move		Yes/No						Europe		Yes/No	
								Middle East		Yes/No	
NUMBER OF YEARS EXPERIENCE											
Operating		Programming		Systems Design		Systems Analysis		Management		Total	
Available for Interviews											
Available for Employment											
DETAILS OF SECONDARY AND FURTHER EDUCATION											
Schools						Date		Examinations Passed			
College/University						Date		Examinations Passed			
Business Courses with Dates											
1. Present Employer										Town	
Position										Date Joined	
TYPE OF INSTALLATION											
Commercial Manufacturing		Bureau Banking		Insurance Education		Scientific Engineering					
HARDWARE				OPERATING SYSTEM				LANGUAGES			
Software or Packages											
On-Line R.J.E.		Real Time Tele Processing		Time Sharing Data Base							
APPLICATION AREAS YOU HAVE BEEN INVOLVED IN (Please Tick)											
Cost Accounting		General Ledger		Manpower Planning		Personnel					
Budgeting		Credit Control		Stock Control		Payroll					
Forecasting		Order Processing		Production Control		O.R.					
Corporate Planning		Marketing		Petrochemicals		Radar					
Sales Ledger		Distribution		Linear Programming		Statistics					
Purchase Ledger		Traffic Analysis		Simulation							
Projects Completed						Responsibilities					
2. Previous Employer										Town	
Position										Date Joined	
TYPE OF INSTALLATION											
Commercial Manufacturing		Bureau Banking		Insurance Education		Scientific Engineering					
HARDWARE				OPERATING SYSTEM				LANGUAGES			
Software or Packages											
On-Line R.J.E.		Real Time Tele Processing		Time Sharing Data Base							
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Budgeting		Credit Control		Stock Control		Payroll					
Forecasting		Order Processing		Production Control		O.R.					
Corporate Planning		Marketing		Petrochemicals		Radar					
Sales Ledger		Distribution		Linear Programming		Statistics					
Purchase Ledger		Traffic Analysis		Simulation							
Projects Completed						Responsibilities					

Reason for Seeking Change						Company Ref. No.					
Details of type of position wanted											
Additional Information - Please explain below, in an 8-10 line precs, your current duties and applications experience											
<b>FOREIGN LANGUAGES</b>											
Spoken				Written				Read			
Please show the number of years experience of the following. Where your experience is not specified please use the blank spaces.											
<b>HARDWARE</b>			<b>OPERATING SYSTEM</b>			<b>LANGUAGES</b>			<b>PACKAGES/SOFTWARE</b>		
IBM 360/370			DOS			COBOL			FILETAB		
ICL 1900			OS			FORTRAN			DRIVER		
ICL 2960/2970			MVT/MFT			ASSEMBLER			CICS		
ICL 2903			GEORGE 1			PLAN			IMS		
UNIVAC 1100			GEORGE 2			PL1			BOMP		
UNIVAC other			GEORGE 3			RPG 2			D BOMP		
BURROUGH 700/800			MCP			USERCODE			PERT		
BURROUGHS other			Exec 8			AUTOCODE			V SAM		
HONEYWELL 66			GCOS			EASYCODER			IDS/TDS		
HONEYWELL 6000			OS 2000/200			ALGO			MICROFILMING		
HONEYWELL other			VMEB/VMEK			NEAT			TELEPROCESSING		
NCR			J Level			CORAL			DMS		
ICL System 4						OLI					
POP											
3. Past Employers											
Position						Town Date joined					
<b>TYPE OF INSTALLATION</b>											
Commercial			Retail Banking			Insurance Education			Scientific Engineering		
Manufacturing											
<b>HARDWARE</b>				<b>OPERATING SYSTEM</b>				<b>LANGUAGES</b>			
Software or Packages											
On-Line R.J.E.			Real Time Tele Processing			Time Sharing Data Base					
<b>APPLICATION AREAS YOU HAVE BEEN INVOLVED IN</b>											
Cost Accounting			General Ledger			Manpower Planning			Personnel		
Budgeting			Credit Control			Stock Control			Payroll		
Forecasting			Order Processing			Production Control			O.R.		
Corporate Planning			Marketing			Petrochemicals			Radio		
Sales Ledger			Distribution			Linear Programming			Statistics		
Purchase Ledger			Traffic Analysis			Simulation					
Projects Completed						Responsibilities					
<b>PLEASE CHECK THAT EACH SECTION HAS BEEN TICKED APPROPRIATELY</b>											
<b>ADDITIONAL INFORMATION</b>											
General											
Data Processing											
Terminals											
Software/Packages											
Application Areas											
Projects and Responsibilities											

שלום



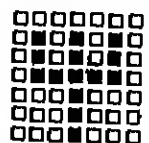
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The Company We are the leading manufacturer of high nickel alloys in Western Europe. We are a successful, stable, progressive and steadily growing company expanding our computer operations in line with other areas, and are now about to introduce data base and real time processing to expedite the development of vital production planning and integrated recording/reporting projects. Hardware consists of an IBM 370/148 2 M/B with discs and tapes and a 3700 distributed processor using OS/VS1 CICS and Adabas. Our main programming languages are PL/I and Assembler.

The Professional If you are an experienced program design or programming

professional with experience of the above or any other similar computer system you can help us develop our computer operations and enjoy the career satisfaction implicit in the development of new systems.

The Rewards We are offering salaries which together with the full range of fringe benefits, including a new voluntary pension scheme, make up an attractive overall package. Assistance with relocation is also provided where appropriate.

Please write, enclosing full career background in detail, to: George Nutter, Senior Personnel Officer, Henry Wiggin & Company Limited, Holmer Road, Hereford HR4 9ST.



## ENGINEERS

COMPUTER and COMMUNICATIONS  
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- Experience needed in any of the following:
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to work for the world's largest independent computing bureau with over 34 DEC 10's - 200 minis, 40,000 miles international network satellite linked to the U.S.A. Excellent career development - on/off site training.

Write: BARRY GALVIN or PAUL BARFIELD on 01-837 1355 or write to Barry Galvin, ADP Network Services, 179-193 Great Portland Street, London WIN 6TB.

## COMPUTER ANALYST/ PROGRAMMER

Chloride Alcad Limited, a leading manufacturer of nickel cadmium batteries and part of the Chloride Group wishes to strengthen its Data Processing Department by recruiting either an analyst/programmer or programmer to its ICL 2903/30 installation.

The successful candidate will join a small team and will have responsibility for developing systems and programs to improve the company's management control information and assisting in the development of major on line integrated systems.

Applicants should have had several years' experience of similar work and be competent in either RPG II or COBOL. The company offers an attractive salary together with excellent career development opportunities.

Please write or telephone for an application form to  
Adrian Bouwens,  
Chloride Alcad Limited  
Union Street, Redditch, Warwick, B98 1SW Tel: Redditch 662351

**CHLORIDE**



## UNIVERSITY OF LONDON COMPUTER CENTRE

The University of London Computer Centre provides a regional computer service to the University of London and to Universities in the South East and South West of England. The Centre is equipped with Control Data 7800, 6800, 6400 and CYBER 72 computers and supports a large communications network of over 50 remote batch terminals and 30 keyboard terminals.

### TELECOMMUNICATIONS A Programmer/Analyst

is required to join a team engaged in the design, development and maintenance of telecommunications systems in mainframes and minicomputers. An exciting programme of development is planned which includes a major commitment to networking and new protocols.

Applicants should have a sound experience in assembly language programming and with telecommunications software.

### SYSTEMS

### A Programmer/Analyst

is required to join our operating systems team and to help in the development and maintenance of the SCOPE 2.1.4 and NOS/BE operating systems. The work is challenging and involves evaluation and implementation of performance and other service improvements.

Applicants should have some experience in operating systems development.

### QUALITY ASSURANCE

### A Programmer/Analyst

is required to join the Quality Assurance Unit at ULCC. This unit is responsible for the integration of operating systems modifications and for the systematic testing of the operating systems, the public compilers and application software. This unit is also responsible for monitoring the quality of service.

Applicants should have at least one year's experience in programming.

### USER SUPPORT

### A Programmer/Analyst

is required to join the team engaged in the implementation, maintenance and support of application packages, including on accounting suite, and in the provision of a professional advisory service.

Applicants should have a good knowledge of at least one programming language, preferably FORTRAN.

Applicants for all posts should be able to do good standard, preferably with post-graduate qualifications. The ability to communicate clearly both orally and in writing is essential. Candidates may be considered who have relatively little special experience of computing but who are very well qualified in some other scientific discipline and who wish to make computing their full-time occupation.

Salary will depend on qualifications, experience and age, but will be within the range £3185-£6178 + £450 London allowance. Holidays: Six weeks per year plus Bank Holidays and two extra days.

Modern offices conveniently located for London Transport Services and Main Line Stations. Lunch meals to purchased Annual Season Tickets.

Further details and application forms are available by phoning Veronica Minards, 01-401 8400 extension 239, or by writing to the Secretary, ULCC, 20 Gower Street, London, WC1.

Closing date for completed application forms: 9th June, 1978

## FORTRAN PROGRAMMERS LONDON

To join the Computer Department of a major International Group of Civil Engineering Consultants and Architects.

### PROGRAMMERS

We have vacancies for two programmers to work in our Notting Hill City office, to advise engineering staff on the use of computer programs and to carry out detailed flow charting, designing files, writing and documenting programs. Requirements are a degree or education to 'A' level standard in maths or science, and a sound knowledge of Fortran.

One post (ref. 1599) is suitable for a beginner. For the other post (ref. 1623) a minimum of one year's practical experience is necessary.

### SENIOR PROGRAMMER

There is a vacancy for a Senior Programmer in our Hemmings office to work with engineers and architects. Duties will include operation and maintenance of equipment as well as writing, testing and maintenance of programs, and program documentation. A minimum of four years' practical experience is required. An advanced Computer Aided Design system is in use, so experience of computer graphics will be of value. (Ref. 1023).

We have Prime 300 mini-computers and for all posts experience of modern mini-computers would be an advantage. We offer excellent working conditions and competitive salaries.

Please apply in writing, quoting the appropriate reference and giving personal details, qualifications and experience, to:

N. W. RAMSAY,  
Director of Personnel, HALCROW  
SIR WILLIAM HALCROW AND PARTNERS  
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POSITION	SALARY	EMPLOYER	LOCATION	HARDWARE ENVIRONMENT	SOME OF THE QUALIFICATIONS	REF. NO.
Systems Designers	to £5,300 + mort.	Financial Services	Heris.	IBM OS	Excellent opportunities for analysts with a programming background to develop interesting financial systems.	21/1
Programmer/Analysts	to £15,000	Software House	Holland	Minis	D.P. professional with experience of process control, networks and M/C control or technical and scientific background urgently required.	21/2
Programmers	to £5,500+	Manufacturer	Essex	ICL	At opportunity for programmers with 2 yrs+ COBOL experience to join a progressive organisation.	21/3
Analyst/Programmers	to £7,000	Software House	WCI	Any	Urgently required - analyst/programmers with minimum 18 months + COBOL experience to join a dynamic organisation.	21/4
RPG II Programmers	c £4,500 +	Insurance	EC	IBM	Programmers with some RPG II experience required to join a new development team.	21/5
Analyst/Programmers	to £17,000 tax free + accom.	Computer Services	Tehran	PDP-11/ASXII	2 yrs+ contracts available for staff with COBOL/FORTRAN and software/application experience on current models of DEC equipment.	21/6
Project Leaders	c £7,000 + +	International Banking	EC	IBM OS	Opportunities for analysts with some team leadership experience and 2 yrs+ analysis to join a dynamic team. Financial background preferred.	21/7
Software Analyst Programmers	to £7,000	Manufacturer	Middx.	Minis	Analyst/programmers with at least 3 yrs. experience and COBOL/RPG II required to join a new development group.	21/8
Analysts/Programmers	to £7,000	Construction Industry	SW1	IBM OS	First class opportunity for analysts and programmers to join a rapidly expanding D.P. department.	21/9
Technical Analysts	to £6,000 + car allow	Manufacturer	N. & S. London	Minis	D.P. professionals required to join a new division of a major company to develop commercial/business systems.	21/10
Analysts	to £8,000 + +	Transport Services	Berke.	IBM + Minis	Openings for analysts with 2 yrs + systems experience. Distributive processing and mini experience preferred.	21/11
Junior Programmer	to 46,000 Guilders	Manufacturer	Amsterdam + travel	Minis	Excellent opportunity for 18 months + assembler programmer to join a small and exciting development team.	21/12
Permanent/Contract Programmers	to £6,000	Software House	EC1	Burroughs	Urgently required to join a rapidly expanding software house, programmers with 2 yrs+ Burroughs COBOL. Some analysis experience preferred.	21/13
Analysts/Programmers	to £6,400 + +	Computer Services	N. Surrey	IBM/Minis	Unique opportunity to join an organisation engaged in DB/TP, COM, maintenance and mini-systems.	21/14
NEAT 3 Programmer	£10,000 + accom.	Software House	Middle East	N.C.R.	Urgent requirement for a 2 yr+ NEAT 3 programmer to work on various applications in UK/Middle East.	21/15
PL/I Programmers	to £5,500	Bureau	N. London	IBM	PL/I programmers with 2 yrs+ experience required to join an expanding organisation to work on a variety of commercial applications.	21/16
Programmers	to £5,500 + mort. +	Insurance	EC2	ICL 1900	1900 COBOL programmers with minimum 18 months' experience required to join this expanding DP department to work on on-line systems.	21/17
Software Staff	to £7,000	Manufacturer	Surrey	Minis	Urgently required - software staff with commercial background to perform administration/training functions.	21/18
Assembler Analyst/Programmers	to £6,000	Insurance	EC3	IBM OS	First class opportunities for analyst/programmers with knowledge of assembler/CICS to develop TP systems.	21/19
Systems Analysts	to £7,000 + benefits	Manufacturing/Distribution	EC1	Honeywell/Minis	Opportunities for analysts with 2 yrs+ commercial experience to join a DP department using terminals/minis.	21/20
Analysts & Programmers	to £6,700	Construction/Building Industry	W. London	ICL 1900	Openings for people with sound 1900 background to join an expanding company.	21/21
Scientific Programmers	to £6,500	Manufacturing/Services	Various S.E. England	Minis	Several interesting posts available to experienced programmers with knowledge of process control/scientific/minis.	21/22
Programmer/Analysts	to £6,000 +	Manufacturer	N.E. Surrey	IBM + Minis	Programmers with 2 yrs+ COBOL/BAL experience required to work on DB/TP applications.	21/23

# 1 PTL 3 PRG

Another winner for Square One. We have recently secured an attractive project which will be developed on client installation in the City. The project is to implement an interactive real-time and database system on Hewlett Packard equipment using the Image database software and Cobol.

We need a good programming Team Leader to control the implementation of the project. He/she should have about five years programming experience with emphasis on planning, scheduling and implementation, good leadership ability and a high degree of motivation. A knowledge of real-time and database would be of advantage. A sense of humour and a willingness to work hard are essential. Starting salary up to £7,000 p.a.

Additionally, we need three good Programmers who have a minimum of two years experience of Cobol, not necessarily on Hewlett Packard. An appreciation of high standards and a desire for interesting work are essential. Starting salary up to £6,500 p.a.

Square One offers good salaries and company benefits including profit share and travel expenses. If you can make the grade as Consultant, contact Ann Truelove on Chesham 75231. Or if you prefer to ring in the evening, leave a message on our answering machine on Chesham 74161.



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The fastest growing independent computer services company in Belgium has immediate openings for a large variety of expertise in the international aero-space industry. A real challenge is awaiting you as an analyst, programmer, software and/or hardware systems engineer, project leader and specific aero-space industry expert.

We offer you:  
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Your experience in the following hardware and software is urgently required:

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IBM 370/160	Malosymbol
IBM 370/161	Control compiler CPL 1
Philips 885	Fortran
Xerox Sigma 9	PL 1
Motorola 6800	Sis 7
Dietz 9000 620	Assembler
AEG 80/20	Excal
PDP 80/20	Carol
Siemens 330	Algal
Mitro 125	Pascal
	Simula



Any other expertise not listed i.e. mech & electronics engineering. Also required an operator 7740 Siemens BS 2000 for 1 year in Luxembourg. Data general 3330 expert AOS-INSOS. Please, let us have your experience; we will make sure you have a pleasant stay with us for a long time to come.

Please give us a phone-number where we can reach you.

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Technical & Commercial Director

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## HERTFORDSHIRE COUNTY COUNCIL SOFTWARE PROGRAMMER

Salary range £5,632-£6,697 p.a.  
Plus phase 3 pay award due 1st July, 1978.

Hertfordshire County Council is one of the pioneers in Local Government computing. As a result of internal reorganisation a vacancy has now arisen for a Software Programmer.

The latest NCR Criterion range, a 1M byte 8680 computer with large disks, fast tapes and terminals, providing virtual storage and interactive programming facilities, will replace the present large Century 261 installation in September.

Responsibilities of the post include:

- \* maintenance of all aspects of the operating system, programming languages, utilities and on-line software;
- \* assisting the Programming Manager with Programmer training and the maintenance of programming standards;
- \* liaison with manufacturers on software developments;
- \* advising Operations staff on techniques to improve machine productivity;
- \* advising staff on programming techniques.

We offer generous holidays (28 days) and a contributory pension scheme with a wide range of benefits. Ideal working conditions — new offices and staff restaurant end, a range of sporting facilities in an attractive rural setting overlooking the County town of Hertford. The centre of London is only half-an-hour away by rail.

Removal, disturbance and lodging allowances are payable in approved circumstances and assistance with housing may be given.

If you would like an informal discussion to learn more about this post, please telephone Peter Beale at Hertford 54242 on extension 5396. Written applications giving full details of relevant past experience, age, etc., should be addressed to the County Treasurer, County Hall, Hertford, quoting ref. CP 46 by 9 June 1978.

## MINI/MICRO PROFESSIONALS

We are particularly interested in professionals with real time mini or micro processors experience to undertake development assignments in and around the London area.

Our usual rates are between £200-£350 per week.

TELEPHONE JIM TAYLOR ON (0279) 418311 — REVERSE CHARGES

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As one of the most advanced Honeywell large users in the UK, we're into data base and TP in a big way, using Honeywell's latest and best software — IOS-2 and OMIV/TP — all under GCOS 4J.

The installation of our new Computer Centre comprises a dual Honeywell 68/110 with 304K words of core, 2,800 megabytes of exchangeable disc storage, tapes, printers and a major network of terminals based on Incoform's 20/30 controllers.

Our first applications are well under way with a major Customer Service System due to go live in April 1978.

We're located in Huntingdon, an area of reasonable housing costs which offers a wide range of leisure pursuits. With Cambridge only a half-hour away — and within 1 hour of London by train, the overall quality of life is high.

The Authority offers excellent conditions of service and generous removal expenses if relocation is necessary.

If you're interested or want to know more about these opportunities, why not call Paula Turner at Huntingdon (0480) 58181 Ext. 371, for information and an application form.

The closing date for applications is 8th June 1978 and should be sent to:

ANGLIAN WATER AUTHORITY  
Brook House, Ouse, Welk, Huntingdon, Cambs. PE18 8NZ

We're looking for:

— a Programming Team Leader to take responsibility for programming project team and to assist with system and program development and also

— the best COBOL PROGRAMMERS around to implement a variety of advanced systems using modular/structured programming techniques and in-line program development.

If you have the experience — but not the Honeywell 68 — we'll train you.

## SENIOR ANALYST

c. £5750+Car & Generous Removal Allowance  
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In addition to a salary around £5,750, plus car and generous removal allowance, they offer:

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Send brief career details please to: Position No. ESS 8779, Austin Knight Limited, London W1A 1DS, or telephone (after 5 p.m.) 01-734 2476, giving address and telephone number.

Applications are forwarded to the client concerned, therefore candidates in which you are not interested should be fitted in a covering letter to the Position Number Supervisor.

**AK ADVERTISING**

## University of Essex

### Computer Officer in the Department of Computer Science Computing Service

Applications are invited for the post of Computer Officer (Grade 1A) — salary scale £3960-£5178 p.a.

Applicants should have an interest in the numerical aspects of computing with particular reference to statistics and their use in the social sciences. Experience in the design and maintenance of Social Science packages, and familiarity with the concepts of low level language programming would be an advantage. The successful candidate would be an integral part of the Department of Computer Science, which has an established reputation for research and development in all aspects of computer science. This is a full-time post with a salary of £3960-£5178 p.a. plus a shift allowance of £120 per annum, making a total of £4080-£5298 p.a. plus pension and other benefits.

Applications (with copies), including a curriculum vitae, should be sent to the Registrar (AG 22/CV), University of Essex, Wivenhoe Park, Colchester CO4 3SQ, Essex. Further details may be obtained by June 30, 1978.

### CITY OF LONDON POLYTECHNIC COMPUTER SERVICE COMPUTER OPERATOR

Applications are currently invited for the post of Computer Operator in the City of London Polytechnic.

The successful applicant will join a small team operating at the City of London Polytechnic, which is a leading institution in the field of computer science. The post involves the operation of a large mainframe computer system, and the successful candidate will be responsible for the day-to-day running of the system, ensuring that it is always available to the users.

For further details and an application form, please apply to the City of London Polytechnic, 117 Houndsditch, London EC3A 7DU.

### TAMWORTH BOROUGH COUNCIL BOROUGH TREASURER'S DEPARTMENT COMPUTER OPERATOR

Applications are invited for the post of Computer Operator in the Borough of Tamworth.

The successful candidate will be responsible for the day-to-day running of the computer system, ensuring that it is always available to the users. The post involves the operation of a large mainframe computer system, and the successful candidate will be responsible for the day-to-day running of the system, ensuring that it is always available to the users.

For further details and an application form, please apply to the Borough of Tamworth, 117 Houndsditch, London EC3A 7DU.



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### County Surveyor's Department TECHNICIAN (Computer Services)

Salary £3396 to £4214  
(Inclusive of supplements)

Required to provide technical support and guidance to users of Engineering Application Packages. Present computer ICL 1904 S running under George III to be replaced in near future by Honeywell Level 80.

Applicants should be educated to H.N.C. standard in either Engineering, Mathematics or Computer Science. Experience in Engineering and/or Computer Application would be an advantage.

Assistance with removal expenses up to a maximum of £500.

Further information and application form from County Surveyor, Shire Hall, Bearland, Gloucester GL1 2TH. Closing date 12th June, 1978.

## Gloucestershire County Council



### EAST STAFFORDSHIRE DISTRICT COUNCIL TREASURER'S DEPARTMENT SYSTEMS ANALYST

Grade AP.4/5/50.1 — £3981-£5085  
(including supplements)

Applications are invited from experienced systems analysts for this post which ranks second in the Computer Section. The successful candidate will be responsible for the day-to-day running of the computer system, ensuring that it is always available to the users. The post involves the operation of a large mainframe computer system, and the successful candidate will be responsible for the day-to-day running of the system, ensuring that it is always available to the users.

For further details and an application form, please apply to the East Staffordshire District Council, Town Hall, Burton upon Trent, Staffs. DE14 2EB, no later than 31st May, 1978. Please quote reference T.3.D.

## KUWAIT

### Senior Organisation & Methods Analysts

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Our client is Yusuf A. Alghanim & Sons, without doubt, one of the most successful companies in Kuwait. They are the second largest General Motor dealers in the world and have many other interests which include travel, electronics and construction.

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They now would like to meet a number of experienced Organisation and Methods "all-rounders." They are particularly interested in Analysts who have experience of clerical work measurement in a financial environment and also those who have developed clerical systems linked to computer development.

Currently, you will be working either as a Senior Analyst or as an O & M Supervisor, or Manager, and will have at least 4 years' organisation and methods experience. You will be capable of working on your own for reasonable periods of time and will certainly be a self-starter.

On the personal side, you will probably be married, will regard a move to Kuwait as more than a short-term episode in your career, and will realise the importance of the move in the context of your total career development.

Apply by sending full career details to John Goldsmith, quoting Ref. 1589, as our clients will be in the United Kingdom during the first week of June.

**Yusuf A. Alghanim & Sons w.l.l.**

## Data Control Supervisor

c. £4,700 Bracknell

Avis is the acknowledged world leader in vehicle rental and Avis Management Services Ltd in Bracknell is the headquarters of the Europe, Africa and Middle East Division of the Company.

Our Systems Department plays a major role in the success of the organisation and due to an internal move we now have a vacancy for a Data Control Supervisor.

Reporting to the Operations Manager, the person appointed will be responsible for the day to day running of the Data Control section with the supervision of two staff. User contact throughout the Division is an important aspect of the job together with ensuring that deadlines on schedules are met and recommending non-routine action as required. Responsibility for designing and implementing of standards for the section will also be an important factor.

Candidates should be over 25 and be educated to a minimum of O level standard with three years' previous experience in work scheduling and administration within a computerised environment. Previous supervisory experience is essential.

Salary and job prospects are excellent within this expanding department and the Company offers a non-contributory pension scheme and a subsidised staff restaurant as part of the benefits package.

Please write or telephone for an application form to the Personnel Department, Avis Management Services Ltd, Avis House, Station Road, Bracknell, Berkshire, Bracknell 20644.



**AVIS Management Services**

LOLA (London OnLine Local Authorities) provides computer facilities to a consortium of four London Boroughs. The Computer Centre is situated in modern offices at Enfield and current equipment is a 2 megabyte IBM 370/158. On-line updating facilities are supplied on over 100 remote VDUs with programs written in PL31 running under IMS/VS.

Currently there are vacancies for:

### LEADING OPERATORS (£4,330-£5,269 Incl.)

Applicants should be at least 18 years old and have minimum of 18 months' experience of OS/VS1 for comparable operating system. IMS experience would be deemed an advantage. Preferably educated to 'A' Level but consideration will be given to people with 4 'O' Levels including Maths.

### SHIFT CONTROL CLERK (£4,330-£5,269 Incl.)

Applicants should preferably be educated to 'A' Level Standard but must have at least 4 'O' Levels. One year's experience in a Control environment is necessary plus a good working knowledge of JCL.

### OPERATORS (£3,834-£4,243 Incl.)

Applicants should have a minimum of 1 year's experience of OS/VS1 for comparable operating system. Availability for 3-shift working is essential. A cost of living increase to take effect from 1 July is currently being negotiated. Assistance is given with legal fees and removal expenses where appropriate. Further details about the Operating posts from Peter Anthony on Ext. 268 and from Norman Bennett on Ext. 230 for Shift Control Clerk vacancy.

Application form from Mrs. B. Dorrington, LOLA (London OnLine Local Authorities), Tower Point North, Sydney Road, Enfield, Middlesex EN2 8UE. Tel: 01-305 8911 (Ext. 276).

**LOLA**



## COMPUTER ENGINEERS

Due to continued expansion of our Engineering Support Group, further vacancies now exist for Support Engineers.

Applicants should have previous experience of either mainframe or mini computer systems and associated peripherals.

Salaries are negotiable up to £5000 p.a. and a company car is provided.

Please telephone (reversing charges) Redflett 2211 and ask for Steve Clarkson, or you can write him at the following address:

**GMC** Computer Machinery Company Limited  
Dart Building, Colney Street, St. Albans, Herts.  
Telephone Redflett 2211

## OEM Sales Engineers Argus 700 Computers

A major expansion in OEM sales of the highly successful Argus 700 range of minicomputers has created openings for Sales Engineers at our Wythenshawe Division in South Manchester.

These posts offer excellent opportunities for progression within this expanding Division of the Company. Competitive salaries will be offered and a company car will be provided where appropriate. If you have a background in Minicomputers and believe you can contribute to our OEM sales, apply, quoting reference 78WD23/CW, to:

Mr. W. L. Robinson,  
Ferranti Limited,  
Simonsway,  
Wythenshawe,  
Manchester,  
M22 5LA.

or ring John Cummings, OEM Sales Manager, on 061-437 5391 for an informal chat.

**FERRANTI**  
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## HERTS AND NORTH LONDON

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Haymarket Computing are D.P. recruitment consultants to 38 companies in the Herts/North London area, and we are currently anxious to meet Analysts, Analyst/Programmers and Programmers on behalf of clients located in: Stanmore, Harrow, Borehamwood, Cockfosters, Enfield and Tottenham.

Applicants will be invited to look through our client register which details the companies, positions, salaries, prospects, etc., so that we may jointly choose the vacancies best suited to your requirements and experience.

For more information ring:  
**HAYMARKET COMPUTING LTD.**  
Tel: Cuffley (Herts.) 4130  
up to 6:30 p.m.



LONDON BOROUGH  
OF BROMLEY

### SYSTEMS ANALYST

AP. 8 £4,850 - £4,900  
Inclusive (REF. 8.278)

The post is in the Borough Treasurer's Department which operates on ICL 1903T computer running under the George 3 operating system, with terminals and VDU's.

The work is of a varied nature and there is opportunity to become conversant with the many differing applications, both financial and non-financial in the local government field. The successful applicant will initially be involved in assisting with the design and implementation of a new budgetary control system with provision for on-line VDU facilities.

Applicants should have been educated to University degree standard or have five G.C.E.'s with two at 'A' level standard. They should have also undergone formal training (ideally obtaining the NCC certificate in systems analysis) and have had at least three years' experience in the development and maintenance of computer systems.

For further information please telephone the Computer Development Manager on 01-464 3333. Ext. 3288.

Application forms from Assistant Chief Executive (Manpower), Town Hall, Bromley SE1 15B. Tel: 01-464 3333. Ext. 3218. Closing date: 7th June, 1978.

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## Training Officer

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The areas of responsibility are for training new staff in COBOL (ANS), Basic Systems Analysis and Design, Structured Programming and BAL (IBM). The jobholder will liaise with the management on the overall training requirements of this section of the staff and monitor the performance of candidates studying for BCS membership.

The successful applicant will be expected to possess the relevant academic qualifications and/or practical experience in a large installation. This appointment would be of particular interest to a lecturer seeking at the same time to widen his knowledge of a large commercial installation.

Salary will be commensurate with experience, starting at £5,238. The Company has a non-contributory Pension Scheme and other fringe benefits.

Applicants are invited to write to E. Watson, Personnel Manager, The Joint Credit Card Company Limited, Access House, 200 Priory Crescent, Southend-on-Sea, Essex, SS2 6QQ.

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Ext

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### The University of Sussex Systems Programmer

Graduate (male / female) experienced in programming required for a systems programming post in the Computing Centre which has ICL 1904S and CTL Modular One computers. Two systems programmers are responsible for operating subsystems, installing updates of manufacturers software and producing performance and utilisation reporting software.

Faculty post on Other Related Grade 1A. £3,960-£6,178 per annum with four weeks' annual leave plus approximately 16 days University closure and bank holidays.

Application forms from the Staff Records and Recruitment Officer, Sussex House, University of Sussex, Falmer, Brighton BN1 9RH, to be returned not later than 23rd June, 1978. For further information telephone Brighton 608755, Ext. 562.

### Quality Assurance

SPL International is one of Europe's largest software and systems houses. We are expanding our activities over a wide range of advanced projects and need:

\* A computer professional to join our Quality Assurance Group in London.

The Group is responsible for the organisation, production and maintenance of standards, quality control methods, and the continual review and audit of all our projects carried out in the UK and overseas.

Applicants must have previous experience of project leadership and be able to demonstrate achievements in the development of standards and quality control methods and procedures. They must be keen to develop their careers in the vital area of Quality Assurance, be capable of working in a multi-project environment and be tactful, confident and professional in approach.

Salary by negotiation according to experience. To discuss this opportunity and to arrange an interview please write or telephone:

M. J. Phillips,  
Quality Assurance Manager,  
SPL International  
19-14 Windmill Street,  
London W1  
Tel: 01-436 7833

**THE POLYTECHNIC, WOLVERHAMPTON**  
The Polytechnic runs a 96K ICL 1903A under the George 3 operating system and is planning to replace this in 1979 with a large interactive system supporting terminals located in all the academic and administrative sections of the Polytechnic, both locally and at remote sites. We are looking for staff to join an expanding team to deal with the rapidly growing computing applications into the 1980s. Two vacancies currently exist.

### PROGRAMMER

Applicants should preferably have a sound programming background (not necessarily in an education environment) but new computer science graduates will also be considered. The work generated within the Polytechnic is of a varied and interesting nature. Many new applications will arise with the introduction of the planned interactive system.

### SHIFT LEADER/ SENIOR COMPUTER OPERATOR

Applicants must have 1900T computer operating experience and be prepared to adapt to the challenges of the new system. Two shift working is in operation during term time single shift during vacations.

Salary Scales:  
Programmer £2,983-£4,214 p.a.  
Shift Leader £2,983-£3,323 p.a. plus 14% shift allowance.  
An increase on these scales is expected within the Government's Stage Three Policy with effect from 1st July, 1978.

Assistance with removal expenses will be given in the appropriate cases.  
Further details and application form from:  
The Establishment Officer  
The Polytechnic  
Wolverhampton WV1 1LY  
Tel: Wolverhampton 27371

# MYTH SHATTERING NEWS FROM CAP-CPP

In the computer world things move fast. So fast that many people have to form opinions quickly. Sometimes those opinions are based not on fact but on myth. Maybe you have the wrong idea about CAP-CPP. We believe CAP-CPP leads the world in software for new computing technologies, as well as being an established leader in more traditional computing skills.

## "MYTH"

A software house like CAP-CPP cannot offer me a future the way computing is going.

For 16 years CAP-CPP has grown and made regular profits. During this time we have built a considerable expertise in many areas of computing. Next year we will spend nearly £14 million on staff courses and training to ensure that our staff stay ahead of the market in their skills.

### BASIC SOFTWARE PROGRAMMERS/DESIGNERS READING TO £6,000 + BONUS

3 years' practical experience of compilers, operating systems and communications software is needed. Knowledge of RPN1 software and COBOL 66 would be of particular interest. Ref. No: 1156/CW.

### BUSINESS ANALYST READING/MANCHESTER TO £7,000 + BONUS

At least 4 years experience on minis and commercial systems involving a variety of applications is essential. The ability to liaise with clients in a pre and post sales advisory role is expected. Typical experience would cover accounting, order processing and stock control systems. Ref. No: 1157/CW.

### COMMERCIAL PROGRAMMERS LONDON/MANCHESTER TO £7,000 + BONUS

A minimum of 2 years experience on batch or on-line commercial systems is required. PL/I, RPG/2, COBOL or Assembler experience would be useful. Team leading experience would be an advantage. Ref. No: 1158/CW.

### PROJECT LEADERS READING & MANCHESTER TO £7,500 + BONUS

5 or more years experience in commercial or technical projects with at least a year in a project leading role. Suit applicants who have the ability to attend to administrative detail coupled with a keen interest in remaining involved with the technical aspect of computing. Ref. No: 1159/CW.

## "MYTH"

CAP-CPP specialises in large banking and insurance projects on large mainframes.

The major portion of our work is now in the small business systems field using minis and micros but often for large clients. Our staff work closely with a number of mini and micro manufacturers, as well as in the traditional areas of mainframe computing.

## "MYTH"

CAP-CPP only recruit people with lots of experience. The majority of our recruits are new graduates who join as trainee programmers. However we are always interested in recruiting staff with limited experience as well as those who have reached senior levels, who want to develop their careers in a company whose future and prime interest is computing.

### ON-LINE SYSTEMS DESIGNERS LONDON/READING/MANCHESTER TO £7,500 + BONUS

Our systems include the use of a wide range of equipment including DEC, IBM, ICL, Zilog, Intel, Motorola and Burroughs. The range of software used is even greater and applications areas include warehousing, process and stock control. Ref. No: 1160/CW.

### CONSULTANTS LONDON/READING TO £7,500 + BONUS

Involves organisational reviews, feasibility studies, equipment selection, producing systems development plans and requires a developed ability to deal directly with senior management. At least 5 years DP experience is required. Ref. No: 1161/CW.

## BENEFITS

A well established career development plan. At least 4 weeks' holiday, sick pay scheme, group sickness insurance and share purchase facilities. Senior staff are eligible for an annual bonus based on profits. Removal assistance is available where appropriate and we will arrange local interviews where possible.

To apply, complete and send the coupon, quoting the relevant reference number, to:

Tony Knott, Computer Analysts and Programmers (UK) Ltd.,  
CAP House, 14/15 Great Jones Street, London WC1.  
Telephone No: 01-242 0021.

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
POSITION \_\_\_\_\_  
REF NO. \_\_\_\_\_

CAP-CPP

Jeffie Ltd



# australia

## DP CAREER OPPORTUNITIES

### Short Term and Permanent

DATEC is one of Australia's largest and oldest independent computer services companies, specialising in customised applications. In 12 years of operation it has grown to a consulting staff of 110 with offices in Sydney, Melbourne, Brisbane, Adelaide, Canberra and Perth. The company operates in all areas of the commercial computer industry—consulting, systems design and programming on mainframe and commercial minis, operating a Turnkey Bureau and conducting EDP Training. Datec also markets a range of software products and mini-computer hardware/software packages.

Over the next 12 months we are looking to a gradual controlled expansion of our business both geographically and into new ventures. As a result we will need a parallel expansion of our staff, and are looking for personnel in the following areas to join us during this period.

#### Project Managers and Project Leaders

##### \$A18,000-\$A25,000

These positions entail the management of mainframes or minis of application development projects for private and public sector clients. Applicants should have had responsibility for running successful project teams developing DP systems from initial design through to program development and implementation. SOFTWARE PRODUCTS SALESMEN are also required.

#### Specialist Senior Analyst Programmer and Project Leaders

##### \$A15,000-\$A20,000

We require people with a high level of experience in one or more of the following areas, or the equivalent on CL or other computers:

- IMS and/or IMS/DC
- OS/VS Systems Programming
- OS/VS and/or OS/VS
- PL/I
- MARK IV
- CICS
- Honeywell IDS TDS
- On-line Intersection

Applicants will have a minimum of five years experience and be capable of being a lead programmer and/or analyst in the field without undue supervision and be able to work as part of a Project Team reporting to a Project Leader or Project Manager.

#### Programmers and Analyst Programmers

##### \$A12,000-\$A17,000

Applicants will have a minimum of three years experience in commercial applications development on mainframes or commercial minis. You will work in small project teams utilising well proven documentation standards.

Our founder and Managing Director, Mr. Harry Douglas will be in London from 8th June to interview prospective candidates. Enquiries from Australia interested in returning home are also welcome. Send a detailed resume (including day and evening phone nos.) to Mr. Douglas at the London Hilton Hotel, Park Lane, London, W.1. Letters should be marked "Hold for Arrival of Mr. Harry Douglas on 8th June".



Datec Pty. Ltd.  
220 George Street,  
SYDNEY N.S.W. 2000  
AUSTRALIA

# Chessell

## Programmer/Analyst

South Coast Fortran £5,500 Neg.

Chessell Limited, manufacturers electronic recording instrumentation and has a record of outstanding growth. We recognise the need to develop computer-aided systems in the areas of order processing, manufacturing control and accounting and wish to appoint a D.P. professional to make a major contribution in this area.

We plan to duplicate our existing HP 1000 hardware, which is used for engineering activities, and purchase proprietary software to form the basis of our commercial systems. The person appointed will have responsibility for programming, development and operations, and will have several years' experience of FORTRAN and HP systems, preferably gained in a commercial environment.

We offer pleasant working conditions and relocation expenses if appropriate. Career prospects are excellent in a company which is part of the British-controlled Eurotherm International Group.

Please write with full details to:  
David Taylor, Materials Manager  
CHESSSELL LIMITED  
Southdownview Road, Worthing  
West Sussex, BN14 8NL

EUROTHERM INTERNATIONAL GROUP

## I.B.M. COBOL CONTRACTS

To £250  
per week  
all areas  
ring Penny  
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### CONTRACT PROGRAMMERS

Hewlett Packard 2000 with RTE  
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### RPG II/BASIC

I am looking for people with 18 months plus experience in RPG II/BASIC. Well-paid permanent work up to £8,000 per annum. Meetings arranged, any time, anywhere.  
01-506 8876 (24 hours)

## The Polytechnic of North London

LONDON POLYTECHNIC  
COMPUTER UNIT  
RESEARCH FELLOW  
— SYSTEMS ANALYSIS

The Polytechnic wants to replace its present computerised student registration system with one which deals adequately with a constantly changing data base, provides outputs more clearly related to the needs of its users and which is based on sound principles of software design, implementation, documentation and maintenance. It is hoped the system will form part of a more comprehensive data base for management information.

A research fellowship is offered, initially for two years, to someone with postgraduate experience in the design and implementation of personal record systems. Some knowledge of the operation of institutions of higher education would be an advantage. The fellow would be expected to examine the needs of the Polytechnic, proceed to the design of a system and then oversee its implementation. Full support will be available from the Registry, Campus Use and computer science staff of the Polytechnic.

Salary scale £322-C2238 including London Allowance. Commencing salary according to qualifications and experience.

Applicants should be made to Head at LPU, Polytechnic of North London, Holloway Road, London N7 8DS.

## PLYMOUTH POLYTECHNIC

Computer Centre  
SYSTEMS PROGRAMMER  
L.C.L. 1903A/2903

Salary £2,200-£2,418.30 (including supplement)  
To be concerned with development for the L.C.L. 1903A/2903 installations including user support, software development and testing, and programming advisory service.

Experience in Groups 2 and Mainframe and previous experience in Fortran and Basic. A working knowledge of Cobol and/or Pls will be advantageous.

Placement on salary will be consistent with experience and qualifications.

Application forms to be returned by Friday, 8th June, 1978, can be obtained with further particulars from the Personnel Officer, Plymouth Polytechnic, Drake Circus, Plymouth PL4 8AA.

# COMPUTER SYSTEM MANAGER

Laisure Arts Ltd., rapidly growing distributor of products through Direct Marketing and part of large International Group, will shortly be converting to a computer based fulfilment system, using a Computer Bureau. A COMPUTER SYSTEM MANAGER is now being sought to provide the link between Laisure Arts and the Bureau to ensure smooth implementation and on-going interface between the two Companies.

This is a permanent position offering a great field situation to a senior person, keen to become heavily involved in the challenging problems offered by a large organisation.

The Computer System Manager will report direct to senior management and be responsible for project administration, organization of the conversion, staff training, and, therefore, good communication skills and knowledge of computing essential. Some knowledge of Direct Marketing desirable.

Applicants should have ideally carried managerial responsibility for implementation of at least one major commercial system.

Good salary and usual perks for a senior position.

Write in confidence with complete resume to:  
Laisure Arts Ltd., Managing Director  
LEISURE ARTS LTD.  
18 St. Ann's Crescent, London, S.W.18

## SENIOR ANALYST/PROGRAMMER

### TO £6,250

## OPERATOR BANKING

### TO £3,500

#### N.W. LONDON

We are the London subsidiary of Israel's largest bank, and have installed an IBM System/3 Model 12 at our N.W. London Computer Centre. In service our rapidly expanding UK business. Later this year we shall be upgrading to an IBM System/3 Model 16.

We require an Analyst/Programmer with a minimum of three years' D.P. experience to join our O.P. staff in a position of responsibility. Experience of at least one of the following is essential: IBM System/3, RPG II, Banking or Financial applications. This is a senior position with the emphasis on systems work and the successful candidate will be expected to supervise the Computer Manager.

We also require an operator with a minimum of one year's experience of System/3 to work two-shift system.

An attractive range of fringe benefits apply.



Write or Phone —  
The Computer Manager  
Bank Leumi (UK) Ltd.  
101 Golders Green Road  
LONDON, NW11  
Tel. 01-455 6611

## COBOL PROGRAMMER

STARTING SALARY UP TO £4,800 per annum  
(including Phase III with effect from 1.7.78)  
Grade 3 or 4

A vacancy has arisen for a Cobol Programmer in the Company's computer section. The successful candidate will have a minimum of 2 years' experience on ICL Computers, preferably a 2803. A sound knowledge of ICL facilities is sought along with operating and RPGII experience, although the latter is not essential.

Please telephone, or if you prefer write, for an application form to:  
C.R.S. Lewis  
The Sutton District Water Company  
68 Gander Green Lane  
Sutton, Surrey  
Tel: 01-843 8080

## LEICESTER POLYTECHNIC

Tenders are invited for the supply of a Mini-Computer System for teaching and research purposes on B.Sc. and B.Sc. (Hons.) Computer Science and HNC Computer Studies in the School of Mathematics, Computing and Statistics.

Further details and tender documents, which are to be returned by 18th June, are obtainable from the Secretary, Leicester Polytechnic, P.O. Box 143, Leicester, LE1 6BH.

## SOUTH MANCHESTER TEAM EXPANSION

Our client is a leading engineering concern based in South Manchester, engaged in motorway construction. They are looking for a team of experienced professionals to develop and implement a new system for their UK-based factories and the direct of new hardware is imminent and will probably be completed by the end of the year. We are currently considering and evaluating proposals for a client who would like to discuss prospects with those in the following categories:

Systems & Programming Manager (1) £6000 p.a.

A minimum of 5 years' experience of systems analysis, preferably with financial engineering applications.

Senior Programmers (2) £4000 p.a.

A minimum of 4 years' COBOL programming. A knowledge of PL/I and/or Fortran is an advantage.

Systems Programmer (1) £4000 p.a.

A minimum of 2 years' experience in systems analysis, knowledge of stock and production control in an engineering environment will be advantageous.

Programmers (2) £4000-£4800 p.a.

A minimum of 2 years' experience in systems analysis, knowledge of stock and production control in an engineering environment will be advantageous.

Systems Analysts (2) £4000 p.a.

A minimum of 2 years' experience in systems analysis, knowledge of stock and production control in an engineering environment will be advantageous.

For all positions relocation expenses are available.

To apply for these vacancies, please write or telephone to:  
RICHFIELD LIMITED (Computer Recruitment Consultants)  
Bridge Buildings, Ladybridge Road, Cheshire Holmes, Cheshire  
SK8 5LL — 061-486 0581 — 001-980 6878 evenings/weekends  
After-work discussions can be arranged.

## CONTRACT PROGRAMMER

### COBOL/DOS/DLI SOUTH ENGLAND TOP RATES

X-Cell Computer Services  
49 Tulse Street, W22  
01-353 8201

## OPERATORS WANTED TO JOIN OUR SWITCHBOARD

Call today! Don't delay!  
VIP CONSULTANTS INTERNATIONAL  
01-481 3318/7492 8495

## PROGRAMMERS

P.D.P. RX x 11

Preferably with real time experience for don area. Lots of prospects.

Tel. Penny Bailey on 01-402 9355

## ENGINEERING WRITER

A vacancy has arisen within the Engineering Support Group for an Engineering Writer to be responsible for the origination of technical manuals for Computer Engineers.

Previous experience is desirable, although suitably qualified engineers will be considered.

Salary is negotiable up to £6000 p.a.

Applicants should telephone (reversing charges) Radlett 2211 and ask for Steve Clarkson, or you can write to him at the following address:

**CMC** Computer Machinery Company Limited  
Cart Building, Colney Street, St. Albans, Herts.  
Telephone Radlett 2211

## CONTROL SUPERVISOR

CITY £4200  
Our client, a major industrial manufacturer, is seeking a Control Supervisor for their IBM 370 installation. The ideal applicant should have worked as an operator in a similar position and will also possess some key punching experience. The successful candidate will be responsible for the day-to-day operation of the system, ensuring that all jobs are completed within the required time limits. The position offers a challenging and varied role with a high level of responsibility. The successful candidate will be expected to supervise the operators and ensure that the system is running smoothly at all times. The position is a full-time role with a salary of £4200 per annum.

## IBM SHIFT LDR.

CITY £2800  
This is an excellent opportunity for an operator with a minimum of 4 years' OS experience, to work in a commercial environment. The chosen candidate, who should be both mature and intelligent, will possess a high level of technical competence and should be fully conversant with JCL and utilities. Responsibilities include supervising operators, ensuring that all jobs are completed within the required time limits, and ensuring that the system is running smoothly at all times. The position is a full-time role with a salary of £2800 per annum.

## IBM SENIOR OP.

£2400  
18 months' operating experience is a requirement for this exciting commercial installation. A thorough understanding of the OS operating system and utilities is essential and the person selected will be required to work a 3 shift system.

## IBM OPERATORS

£2300-£2800  
Numbers are an asset for ambitious young people seeking to progress in Computer Science. Applicants should have a minimum of 1 year's experience in a similar position and should be fully conversant with JCL and utilities. The position offers a challenging and varied role with a high level of responsibility. The successful candidate will be expected to ensure that the system is running smoothly at all times.

## OPERATIONS - VARIOUS

IBM 370	Op. Anal.	3 yrs	Op VS1	0AY9	City	£2100
IBM 370	Sen. Op.	3 yrs	Op VS1	3-shift	City	£2700
IBM 370	Tech. Supp.	12 mths	Op VS1	0AY9	City	£2100
IBM 370	Op	10 mths	Op VS1	3-shift	City	£2100
IBM 370	Op	12 mths	Op VS6	2/3-shift	Lon/By	£2400
IBM 370	Op	12 mths	Op VS1	3-shift	Bede	£2800
IBM 370	Op x 3	12 mths	Op VS6	3-shift	Horn	£2800
IBM 370	Op	12 mths	Op VS6	2-shift	L. Lon	£2800
IBM 370	Op	6 mths	Op VS6	0AY9	City	£2800
IBM Sys 3	Op	8 mths +	DCR	1/2-shift	C. Lon	£3200
84700	Sen. Op	10 mths	3rd Sen	3-shift	Bury	£2800
84700	Op	12 mths	2-shift	Essex	£2400	
ICL 1900/2800 OPERATORS			12 MONTHS' EXPERIENCE			£2400
ICL 1900/2800 OPERATORS			8 MONTHS' EXPERIENCE			£3200
ICL 1900/2800 OPERATORS			3 MONTHS' EXPERIENCE			£2800

We always have requirements for good 'O' level, 'A' level and Graduate Trainees for positions in London and the Home Counties.

**COMPUTER TWO THOUSAND**  
01-837 3285 217/216 Tottenham Ct Rd W1P 6AF  
Personnel Consultants Lic No SE1A163

## Management Computing Services Limited

## Honeywell Operators

Management Computing Services Ltd., is a subsidiary of Centre-File Ltd., one of the leading U.K. computer bureaux currently servicing some 2,500 customers throughout the country. These include many of the major city and countrywide industrial and commercial organisations, amongst them, household names.

We currently operate our systems on two Series 60 Level 64 Machines and applications are invited from persons with previous Honeywell experience on OS 2000. Successful applicants will have the opportunity in the future of training in the operation of Centre-File's substantial IBM installation.

Salary, within the range £2,250 to £3,730 together with a shift allowance of 27.5%, will depend on experience and fringe benefits include preferential loan facilities.

Applications for this position should be made to Mike Atkinson, Personnel Department, Centre File Ltd. on 01-405 8700 ext 201, or write to him at Boundary House, 18-20 Farnival Street, London EC4A 1JU.

## COMPUTER PERSONNEL

Australian Consolidated Industries Ltd.

is a large Australian manufacturing company engaged in the packaging industry and employing over 20,000 people. ACI Computer Services, as a part of a wholly owned subsidiary of ACI Ltd., is one of the country's fastest growing computer bureaux with a nationwide communications network linking all states to the main computer centre at Clayton, an outer suburb of Melbourne.

The company operates IBM 370/156 and 370/155 machines under SVS for both batch and CICS on-line work, together with Hewlett Packard 2000 and 3000 machines for interactive systems, and new hire vacancies for —

- CICS Analyst or Analyst/Programmer with a minimum of two years' direct experience of CICS systems.
- Interactive Systems Analysts with on-line experience using HP 3000, a COBOL background and in-depth experience with the IMAGE data base system in a commercial environment would be helpful.
- Senior Batch Analyst or Analyst/Programmer who possesses a proven experience in project scheduling and control, with a background in PL/I or COBOL. The successful applicant will be required to ensure project leading duties and must be experienced in Commercial Systems design.

In addition to the above, tertiary qualifications in an appropriate discipline and at least five years' total experience in data processing should be taken as a minimum requirement for all positions.

Interviews will be conducted in the U.K. at the end of June. Written applications, with details of qualifications, experience, references, etc., should be addressed to:

Miles K. Lloyd  
Australian Consolidated Industries Ltd.  
8th Floor, Portland House  
Step Place  
LONDON, SW1

## COMPUTER OPERATIONS IN THE SCOTTISH OFFICE

Applications are invited for posts as Senior Data Processors in the Computer Operations Section of the Scottish Office Computer Services, Stormhouse Drive, Edinburgh. Currently the equipment held is two IBM 370/146 computers but considerable enhancement with very modern equipment will take place this year. Applicants should be at least 17½ and preferably under 30 years of age. Overtimes cover all aspects of computer operations and applicants must be able to undertake shift working (including night shift) on a regular and continuous basis. Previous experience is not necessary as full paid training will be given. Minimum educational qualifications required are O level plus including English O grade level. Successful applicants will be appointed as Senior Data Processors in the Scottish Office. Opportunities are available for advancement to higher grades.

The present salary scale (currently under review) is £2,075 to £2,885 per annum plus pay supplements of between £310.68 per annum and £485.80 per annum. In addition a shift allowance of 15% of salary is currently payable. Selection will be by aptitude test and interview in Edinburgh.

Application forms and further information may be obtained by writing to Mr. M. J. Mackenzie, Scottish Office, Personnel Management (A), Branch 2, Room 407, 16 Waterloo Place, Edinburgh. Tel. No. 031-687 2000. Ext. 531. The closing date for receipt of completed applications is 7 June, 1978.

## COURSES

## Post Office Telecommunications courses in Data Transmission

The Post Office announces, with regret, that due to staff shortages it will not be offering any courses, with the exception of the Data Communications Systems course scheduled for 18-29 September 1978, during the 1978/79 academic year. All courses scheduled for the 1977/78 year are fully booked and will not be affected.

# THE SALES BIT

## It's no good knocking the competition

ONE of the basic rules of selling is that a salesman should never "knock" his competitors. I do not completely subscribe to that philosophy. I agree it is a good starting point in terms of selling discipline, but in absolute terms, the application of this rule is a considerable benefit to the competition.

I believe that attacking competitors is all part of the selling game, and anything goes as long as the salesman obeys two basic rules: Any statement concerning competition must be the truth, the whole truth, and nothing but the truth; and the salesman should never make any statement which might directly or indirectly reduce the professional credibility of his company or himself.

As for as I am concerned, it is the responsibility of the salesman to highlight the inadequacies of competitive products. There must be lots of computer systems identified throughout the country which are totally inadequate and should never have been proposed in the first place. If, in such circumstances, the competitors involved had highlighted the apparent shortcomings of the chosen system, the user would have been better off by ordering from another supplier, or indeed no supplier at all.

I am not suggesting for a moment that all failed systems are due to users being sold the wrong "kit" or service; more often than not failure is due to user incompetence, but it can happen.

So what should a salesman do in order to highlight the limitations of his competitors? For this, and a variety of other reasons, it is essential that he has a comprehensive knowledge of the hardware, software and support capabilities of all principal competitors. In particular, he should have good working knowledge of competitive installations in his locality. If his marketing department can provide information on competitive accounts of a relevant application orientation on a wider geographic basis, so much the better.

All points against competition should be made indirectly. Ideally they should be generated by the client himself as a result of prompting by the salesman. How is this done? In a competitive situation, the salesman, due to his knowledge of competitive equipment, may be able to point out the shortcomings in the product or the installation of a competitor. Simply to say "Don't buy the XYZ minicomputer, it's a load of crap" lacks a ring of professionalism. Even to say something like "The Cobol compiler on the XYZ minicomputer is a figment

of their imagination" is not much of an improvement. To handle the situation satisfactorily, the salesman needs to have a strong relationship with the prospect, who is usually the best source of information concerning real and assumed problems related to competitive equipment.

Once the salesman has identified the failings, and made sure they do not apply to his own product, he must then introduce or reaffirm them with his prospect by indirect means.

I find the best approach is to work with the client in order to agree not only with his decision criteria, but also with the means whereby these requirements can best be quantified.

Then, after some general discussion about what might influence the prospect's decision, which should leave the salesman better informed for the "close", he might continue as follows:

"One predominant problem led to the installation of minicomputer systems has, in some cases, been the unreliability of language processors. In some extreme cases, Cobol, which we agree is essential for you, has been promised when in fact it has not yet been fully tested and released. You cannot afford to take any risks in this area. I believe it is essential that you speak directly with existing users of Cobol in the case of every type of equipment being proposed to you in order to avert the possibility of severe problems at a later date. Don't you agree?"

He almost certainly will, and thus the salesman will be able to wrinkle out a falling in a competitor's product without even mentioning their name, as well as continuing to promote the benefits of his own.

Of course, more often than not, there is no absolute failing in the product of any competitor. In this case, there is nothing wrong with saying something nice about the opposition's product, particularly if the feature is irrelevant.

TRADER

## Puzzler

The requisite sequence is: C C C C T T T T C C C C T T C C T T T T C C T T  
Key to the mnemonic lies in the order of the vowels: ouaeiaaeaeiaaeae. Allocating the numbers 1 to 5 to the conventional layout a-e-i-o-u, gives 4-5-2-1-3-1-1-2-3-1-2-2-1 as a numerical guide to the C-T grouping.



# Computer Challenge

**Analysts, Planners, Programmers, Analyst/Programmers, Data Control Supervisors.**

**Top ranking salaries + Tax-Free gratuity**

If you have a good computer background with experience - preferably within an IBM environment using PL/I - we'd like to tell you about the Technical and Commercial Systems we're developing in Zambia with IBM 370/158 Computers... the prospects there... the life for you and your family... the wonderful climate... and all the other things like low-cost accommodation, children's schooling, holidays and additional benefits.

For further details send us your name and address, quoting reference CW748, to:

The Manager, Zambia Appointments Division, Zimco House, 129-139 Finsbury Pavement, London EC2A 1NA.

**RCM NCCM**

## Systems Analyst/Programmer

We are Bristol Myers Co. Ltd., a major international organisation in the toiletries, hair care and pharmaceutical industries. Our products include "Mama", "Fresh and Dry", "Dove", "Anfurs Junior", "Aftershave", "The Great 1200" hairdryer and "Nivea" "Easy" hair colourant. Currently we have a vacancy for a Systems Analyst/Programmer based at our Head Office at Langley near Slough.

This role requires a mature, self-motivated man or woman who is able to communicate effectively with "users" management and who has a good general commercial systems background. Experience of RPG2 and IBM Systems 3 is essential and C/P knowledge will also be useful.

For the right person the salary will not be an obstacle, and the opportunities for career development are excellent. The company benefits include an annual bonus, pension scheme, and assistance in relocation.

If you would like to know more, please ring now for further details and an application form to Susan Plumbo, Personnel Manager, Bristol Myers Co. Ltd., Semford House, Station Road, Langley, Berkshire. Tel. Slough 44266 Ext. 240.

## Bristol-Myers

## ANGLIAN D.P. SERVICES LTD

## PROGRAMMING CONSULTANTS

**ESSEX up to £6000**

We are committed to developing a variety of systems for many of our clients and therefore wish to recruit several programmers to join our own highly professional consultants.

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Phons Danbury 4255 (STD 024641) Lines open 24 hours, or write ANGLIAN D.P. SERVICES LTD, Standard House, Maldon Road, Danbury, Chelmsford CM3 4QW.

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**TWO IBM DOS/VS OPERATORS**

A leading City-based financial institution has an immediate vacancy for two operators. The successful candidates will be responsible for the operation of the IBM DOS/VS system. The salary is £4400 per annum.

**FOUR IBM DOS OPERATORS** £4400

The City-based financial institution has an immediate vacancy for four operators. The successful candidates will be responsible for the operation of the IBM DOS system. The salary is £4400 per annum.

**THREE ICL 1900/2960 OPERATORS** £3700

The City-based financial institution has an immediate vacancy for three operators. The successful candidates will be responsible for the operation of the ICL 1900/2960 system. The salary is £3700 per annum.

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**FIVE PDP 11 SERIES OPERATORS** £4900

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**WHATEVER YOUR EXPERIENCE!**

If you are interested in any of the above positions, please send your CV to: Mr. Mike Oakes, Staffing, 9 St. Bride St., London EC4.

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The FHP Department within Spring Grove School plays a significant role in the company's operations serving the Group's locations in the UK, Eire and Holland. A comprehensive network is being established in the UK for the first time in 1983.

We are seeking a project professional who will participate in the development of the branch network and manage a small team developing systems for inventory control, time charging, sales accounting and management control. This job will involve working closely with our department.

The successful applicant will have good problem-solving and communication skills, two years' experience in analysis and design, and a working knowledge of COBOL.

This is an excellent opportunity for someone wishing to progress to their first management position. The successful applicant will be based in Henley-on-Thames. Conditions of service include a competitive salary, pension scheme, free day leave and assistance with relocation.

Please write or telephone for an application form.

Linda Farnham, SPRING GROVE SERVICES LTD, Reading Road, Henley-on-Thames, Oxon RG9 1EP. Tel. Henley (0491) 21391.

## Spring Grove

## GRADUATE PROGRAMMER

Consulting Engineers have a vacancy for a Graduate Programmer with a degree in Mathematics or Computer Science and about two years' post-graduate experience. He/she will work on the development of our suite of FORTRAN programs which will be applied in Transport Planning, Statistics, Project Management and accounting, Highway and Structural design. Salary will be dependent on experience.

Please send brief details of qualifications and experience to:

P. R. Bennett, BRIAN COLQUHOUN AND PARTNERS, 22 Upper Grosvenor Street, London W1.

Tel. 01-481 4884

## I.B.M. COBOL CONTRACTS

**To £250 per week all areas ring Penny on 01-402 9355**

**G**

## DATA TERMINAL SALES STAFF

An experienced team of high quality salesmen is being formed to market the Gaveta range of terminals in the whole of the U.K.

Gaveta is a marketing and maintenance organisation and operates on a Pan-European basis with the latest West Coast technology products.

It is expected that a Gaveta salesman, male or female, will earn a 5 figure salary with all the usual facilities. The basic salary will be circa £2k and the prospects for advancement and high earnings are good.

The terminal products are from well-known and established manufacturers such as Diablo, Teletype, Tecand Technican.

A young, company, powerful backing and good prospects.

Write or Call Mike Spiller, Gaveta Electronics Ltd, RMC House, Vale Farm Road, Woking, Surrey. Tel. Woking (04882) 71397.

## PROGRAMMER/ANALYST

**Cardiff up to £4337\***

Wales Gas serve approximately half a million customers and employs over 4000 staff throughout Wales. We currently require Programmer/Analysts preferably with 2 years' solid programming experience and knowledge of the following equipment to work on large data base oriented systems. The mainframe environment consists of Burroughs B3500 processor presently consists of over 80 VDUs, terminal processors and remote printers and the permanently on-line disk storage is currently over 900 million bytes. Salary is in the range £3387-£4337 inclusive of phases 1 and 11 pay policy supplements.

Other conditions of service are good and flexible working hours will be introduced shortly. Some assistance with relocation expenses may be available, where appropriate.

If you think you meet our requirements, please telephone or write to our Senior Personnel Officer for an application form, at Wales Gas, Snelling House, Butta Terrace, Cardiff. Telephone Cardiff 33131.

**WALES GAS NWY CYMRU**

## Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth  
"In the beginning was the word, and the word was four bytes, and thirty-two were the bits thereof."—IBM Technical Report.

### Block 0 (The Header Block)

The scene is a devastated Silicon Valley reservation, laid waste by the midnight mid of the Night Operators. The date is 58 NC. NC stands for New Calendar, as opposed to SC, Before Cybernetics. Year 1 NC was 1948 according to the old reckoning — the date of the publication of Norbert Wiener's book, Cybernetics, and the invention of the transistor.

It is a world totally dominated by machines, a world of androids and robots integrated together by the all-pervading Network into an electronic super-organism known variously as the Information Society, the Solid State or, simply, the System. It is a world in which remnants of the once-proud human race are grudgingly permitted to eke out a pitiful existence on a few meagre reservations.

The System consists of those androids, computers and robots that are its active agents, the high-speed data communication channels of the Network that link them together, and the Database which is their common pool of knowledge. Each member of the System contributes experience to, and relies on receiving information from, the Database. Without this regular data sharing via the Network, the System would cease to exist as a cohesive whole and its component parts would be unable to function.

The System in its present form is largely the result of the pioneering work of a small group of far-sighted System/Network architects who founded Brainchild Electronic Computing Hardware (BELCH) Inc in a garage in San Jose, California, back in the early 40s NC. This soon became a massive, and massively powerful, multi-billion dollar corporation. Indeed it could be argued that the System is Brainchild Corp, though it has absorbed so many elements in its rapid growth that this would be like saying the mighty Amazon river when it pours into the Atlantic is the same thing as the little stream at its source in the upper Andes.

Foremost among the original "brainchildren" of San Jose



was Professor Abraham Synapse, the emigre Russian neurocybernetician who invented the Synoptic Junction. This neural interface unit enabled human, and animal, nervous tissue to be supplemented by a wide variety of electrological processing and storage devices, thus paving the way for androids (hybrid bio-mechanical beings) and later robots (purely artificial intelligences).

Although androids are no longer produced in quantity, since robots are just as efficient and last longer, our hero, the Hexadecimal Kid, is an android of the most advanced type. With the aid of his bionic dog Ascii, constructed during his free time from spare parts, Hex has thwarted Dr Null's attempts to corrupt the Database, around which robotic civilization revolves. He and Ascii have been present at the death in Silicon Valley of this dangerous foe of the artificial intelligences. However, Hex now finds himself, despite his brainful of transistors and a long record of dedicated service to the System, an outlaw — partly because of his own unsystematic conduct, but mainly on account of Dr Null's outstanding revelations.

On his deathbed Dr Null has disclosed that he is none other than Professor Synapse himself. He has also told Hex that he realised too late the inherent flaw in the System he had helped to design, a tendency in gigotic instability which must inevitably lead to the ultimate System Crash; and he has persuaded Hex that the only way to save any kind of life on earth is to destroy the System before it swallows up all other life forms. Furthermore, Hex has found out his own true identity: before being cybernated he

was Samuel Synapse, the professor's son. Armed with this dangerous new knowledge, Hex now sets out with Ascii through the ruins of the human reservation to seek support for his historic mission — to smash the System before it annihilates itself in a gigotic implosion, and brings down with it all traces of intelligent life. Thus the mantle of Dr Null has fallen squarely upon Hex's shoulders.

To fight the most powerful organisation that has ever existed on our planet Hex has no allies except Ascii, no protection other than his own wits, no weapons apart from a soldering iron, and no plan whatsoever. He does not even know how long he can carry on without normal access to the Database; and he has no idea of the steps being taken by the System against him. In particular, he is blissfully unaware of the meeting taking place at this very moment in the Computer Centre's No 1 Machine Room between Commander Kludge, the System's chief Dynamic Debugger, Inspector Extracode of the Error Squad's dreaded Trap Handlers and the Database Administrator, at which Hex's future (or lack of one) is being vigorously discussed — beneath an illuminated wall display on which Hex and Ascii's exact current map reference is indicated by a pair of blinking white blobs.

Yet Hex is unworried as they set off briskly through the bright morning air towards Sprocket's Hole. His first task will be to recruit others to the cause; and there he hopes to find the human girl Cleo and release her from her captors, Davy Sprocket and Wild Bill Bootstrap, to join him. As they walk he cheerfully whistles extracts from the carrier-signal fugue in B-flat minor, basking in his newly won freedom. The only cloud on his horizon is the thought that he may never see Simula again. And even that gloomy thought recedes considerably when he begins to sing a few rousing choruses of the old Dartmouth College Coding Song, with Ascii on synthesizer as rhythm section.

Though your program is unstructured  
And your compilation's dirty,  
If you type in one more statement  
You can leave the rest to Qwerty.

For your logic may be flawless  
And your listings may be clean  
But divide by minus zero  
And you'll hit the damn machine.

So forget the structured program  
With its logic so confusing.  
Keep on typing IF and GOTO  
And especially PRINT USING.

Are Hex and his dog walking straight into a trap? Find out in next week's all-action in statement.  
© 1978, Richard Forsyth, RAEI Timeshare.

## PRODUCT NOTES

## Interface hardware, comms pack from DG

A PACKAGE of interface hardware and communications software announced by Data General for its Micro Nova 16-bit microcomputer enables it to now be used as a terminal concentrator, terminal cluster controller or as an intelligent terminal.

For example, the Micro Nova user can now implement and run IBM 2780/3780 and IBM Hsp II RJE emulation packages.

The hardware for asynchronous communications includes a line controller, the Model 4226, which provides a CCITT V24 interface for half duplex operation at 9,600 baud and carries out full character buffering on reception and transmission.

The Model Nova communications system is supported by Data General's Communications Manager, Cam, software. This runs under the Micro Nova Operating System, RTOS.

The IBM 2780/3780 emulation package, called RJE 80, supports single stream remote job entry tasks, while Hsp II RJE emulates up to seven input and seven output data streams.

Data General Ltd (CW), Westway House, 328 Buxley Road, Exeter, Devon, EX2 8JL. Tel. Exeter (0392) 8221.

## Financial calculator

PREPROGRAMMED business and financial functions are a major feature of the TI-42 MBA financial calculator from Texas Instruments.

The calculator has 32 key strokes that can be programmed into the calculator's memory and executed by one key push. This makes repetitive calculations more easy.

The features of the TI-42 MBA include 12 data memories for storing, sum-

## Dictation machine

A POCKET dictation machine measuring 125 x 65 x 32 mm and weighing 250 grammes is now available from Dictaphone Ltd.

Called the Dictamite, it is operated by a dry cell battery and has a 35mm speaker with a range from 200 to 6,000 Hz.

## Head/track disc unit

HEAD per track disc units, including models for Digital Equipment and Data General minicomputers are now available from the General Instrument Corp. The Model Sys-20 is hardware and software compatible with the PDP-11 and can directly replace the RP-11, RP-11 or RC-11/RS-04. The Sys-20 is 16-inch rack mountable and other features include a capacity of between 64K and one million words, an average access time of 0.3 milliseconds and a data transfer rate of 202K words/second. The Sys-20 costs £5,621.

The Model Sys-10 is hardware and software compatible with the Data General Nova 2, Nova 800 and 1200 and the Super Nova and is a direct replacement for the 4019 disc and control unit. Its other main features are the same as the Sys-20. The Sys-10 costs £5,840.

This Model 700 head per track drive can hold up to 38 Megabits on 256 tracks and costs £2,543, while the Model 530M ruggedised milliradised on 1,056 tracks and costs £11,288.

General Instrument (UK) Ltd (CW), Rotating Memory Products, Bond Close, Kingsland Industrial Estate, Basingstoke, RG24 0QW. Tel. Basingstoke (0256) 59406.

## Display work station

A CONVERSATIONAL display workstation has been introduced by Honeywell for use with its Level 8 mini-computers and Series 80 mainframes.

Called the VIP 7250, it is a teleprinter-compatible and comes with a 1,920 character screen.

Other 7250 features include a dual intensity screen, which enables information from the host computer to be shown at a lower level of intensity than

the data being entered by the operator. Honeywell points out that this can be helpful in applications like order entry.

The 7250 keyboard has 88 keys, including special character keys and a numeric pad. It even keys that can be used for user defined functions. They provide the user with 14 code sequences and typical functions can include calling the next screen of information, recalling the previous screen, requesting a particular application or identifying a priority queue.

Buffered transmission for a line or a full screen of 1920 characters is standard and transmission rates can vary between 75 and 8,000 bits per second.

Honeywell Information Systems Ltd (CW), Honeywell House, Great West Road, Brentford, Middlesex.